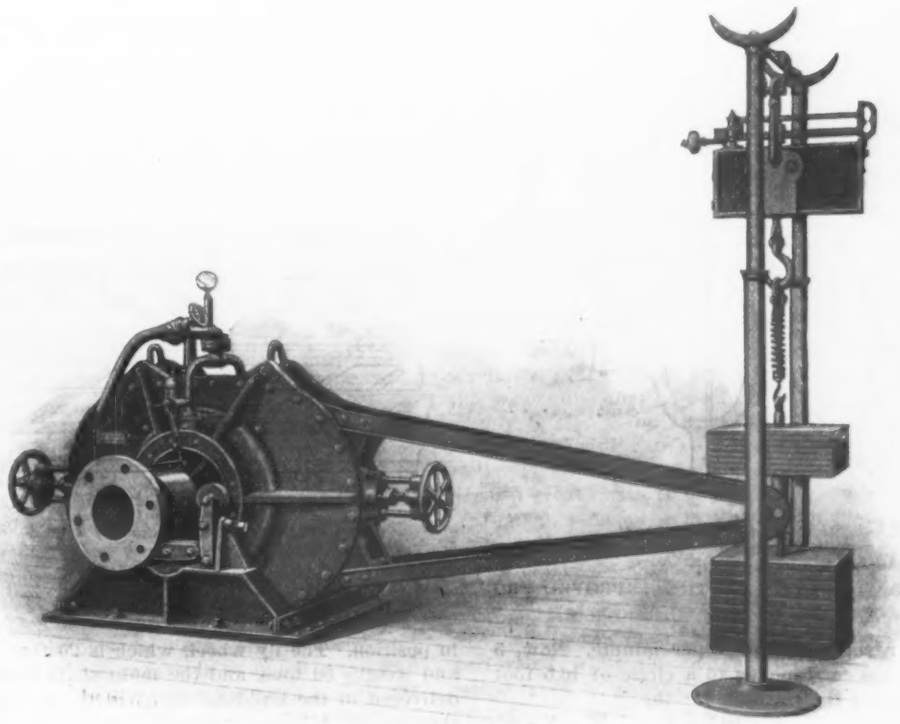
THE IRON AGE

THURSDAY, JULY 31, 1902.

The Improved Froude Water Dynamometer.

The dynamometer here illustrated was originally designed by William Froude for use in his experiments on the propulsion of ships. It has since, states the London *Engineer*, been largely modified for use with stationary engines, and is claimed to be the machine best adapted and most trustworthy for superseding the old type brake band for testing the brake horse-power of engines and motors. An earlier form of hydraulic brake took the shape of an ordinary centrifugal pump, the resistance to rotation being varied to some extent by a valve placed in the outlet pipe. But to measure large powers, say 500 to 1000 horse-power, the apparatus would have become very cumbrous, and the range through which the power absorbed could be regulated would be insufficient. To meet these difficulties Mr. Froude invented a new form of rotator and case, which gave a vastly increased resistance for given over-all dimensions, and also provided means for regulating the resistance through a very considerable range.



THE IMPROVED FROUDE DYNAMOMETER.

The general arrangement of this machine is shown in Fig. 1. It consists of a case, or shell, within which revolves the wheel, or rotator. The latter is a circular disk, and on each side is formed a circular channel of semielliptical cross section. These channels are placed back to back, and are provided with a number of vanes fixed obliquely, as shown in cross section in Fig. 3. On each side of the casing similar channels are fixed, and also provided with vanes, thus forming two complete circular channels of elliptical cross section—Fig. 2—which are divided into a number of complete compartments by means of oblique vanes. The apparatus being completely filled with water, and the rotator set in motion, the water contained in the cups of the rotator, under the action of centrifugal force, is delivered from their outer surface and thrown with considerable force against the upper part of the fixed cups in the casing. The water then circulates round the outer surface of the fixed cups, and enters the bottom edge of the moving cups with an increased velocity, due partly to the velocity of its delivery from the fixed cups and partly to the velocity with which the cups of the rotator meet the jet as it is delivered from the fixed cups. Thus a whirlpool or vortex motion is set up in each cup, the power required to drive the rotator being mainly expended in keeping this going. The whole of the power exerted being converted by friction into heat, in order to keep the machine cool it is necessary to introduce a continual supply of cold water. In doing this it is essential that the whirling motion should not be disturbed, so the water is conducted through holes up the fixed vanes to points lying in the center of the vortex, where the pressure and velocity are low, and the circulation water being under a pressure of 15 to 20 pounds per square inch, lodgment of air at this place is prevented. The inlet pipe for cold water is connected to a circular supply channel at the back of each set of fixed vanes, while the hot water is continually escaping into the outer part of the case and leaves by the outlet pipe shown, which, being at the highest point of the case, assists the escape of air or steam. The connections of these pipes are flexible, so as not to affect the balance of the machine. Cocks are also provided to permit any air collected to escape. It is interesting to note that the total power absorbed may be considerably increased by making the interior surfaces of the cups as smooth as possible, so as to admit of very high velocities of circulation in the individual cups. The power absorbed by the dynamometer is reduced when required by interposing a thin metallic shield between the faces of the rotator and casing, thus cutting off what may be termed

the vortex action. In this manner the power may be reduced from the maximum down to about one-fourteenth of that amount. It will be noticed that the weight of the casing is not supported by the shaft, but carried by means of friction rollers. The rollers are provided with a slight adjustment, so that the shaft may be readily brought into line with that of the engine or motor shaft required to be tested. The revolving rotator necessarily reacts on the case, tending to carry it round with it, the turning moment being equal to that exerted on the driving shaft. The case, being carried on the rollers mentioned, is prevented from turning by a weighted lever, as shown in Fig. 1. It is found convenient to secure steady readings to provide a greater weight than actually required, the portion not supported by the brake being carried by a Dension balance, as shown. The effective weight is, of course, the total weight minus the reading of the balance. For instance, suppose the effective weight supported is W lbs., at 5 feet 3 inches

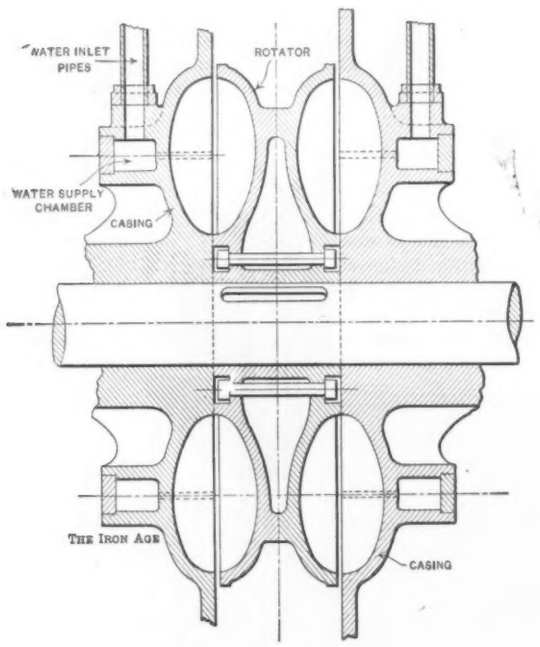


Fig. 2.—Section Parallel with Shaft.

from inlet to outlet and the quantity of water used afford an accurate measure of the power, and the most recent determination of Joule's mechanical equivalent of heat was made by means of a Froude water dynamometer by Prof. O. Reynolds and Mr. Morley.

The advantages claimed for this dynamometer for high speed engine and motor testing may be summed up as follows: That it is suitable for use at highest speeds and for very large powers; it is capable of regulation to any power within its limits without adjustment of weights; it is simple to work, and cannot easily get out of order; it is portable, and requires practically no foundation, and it is absolutely correct in its results.

The Ohio Falls Iron Works.

The Ohio Falls Iron Company, New Albany, Ind., have been making important extensions to their plant. They are erecting a new building, 240 x 380 feet, in which they expect to have their new muck mill in operation by September 1, although a great deal of work is still to be done before it is completed. The muck train is 20 inches x 3 feet high. A corrugated iron roof has been placed over the building. The mill will have seven busheling furnaces and two scrap furnaces, and will have a capacity of 700 tons of muck per week.

A great deal of the machinery and equipment have already been installed, and more is still arriving and being placed in position as soon as the various departments are in condition. Four 250 horse-power Cahall boilers are set up, and the brick work on two of them is nearing completion. The new Corliss engine, which is 24 x 48 inches, has arrived from Milwaukee, and is being put

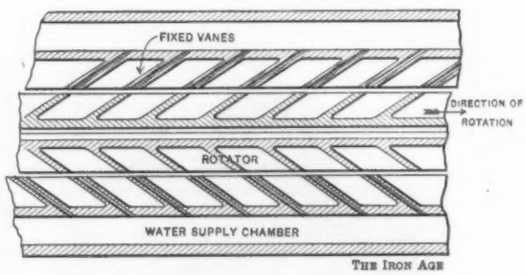


Fig. 3.—Cross Section of Vanes.

THE IMPROVED FROUDE DYNAMOMETER.

radius, and the revolutions are N per minute. Now, 5 feet 3 inches radius corresponds to a circle of 16.5 foot circumference, hence the formula for the

$$\text{Brake horse-power} = \frac{W \times 16.5 \times N}{33{,}000} = \frac{W \times N}{2000}$$

In using the machine the rotator shaft is first brought into line with the engine or motor to be tested and is coupled up. Water is admitted by the inlet pipe, the outlet being opened for the escape of air. As soon as running is commenced the water inlet should be opened full, the flow of water being regulated by the outlet, so that the outflowing does not attain too high a temperature, and a certain amount of pressure is thus maintained in the casing.

The machine is made in a number of standard sizes, and the differences between the various powers are obtained by the regulation of the shields mentioned above, which are moved by the hand wheels at each end of the machine. The maximum power which the machine will absorb varies as the square of the speed; thus, if a given dynamometer takes 100 horse-power to drive it at 100 revolutions it will take 400 horse-power to drive it at 200 revolutions.

The water is prevented from passing out between the casing and the main shaft by the use of ordinary glands and packing, but it will easily be seen that no error is made by their friction, as this reacts on the case in the same direction as the water. It may be interesting to note further that the range of temperature

in position. The fly wheel, which is 20 feet in diameter and weighs 50 tons, and the main shaft have also been delivered in the building and will be put in place in a short time. A hammer weighing 50,000 pounds has been set up near one of the pair of furnaces. The 60-inch squeezers are being installed, and work on the furnaces and stacks is making rapid progress. The foundations for the shears are finished and the shears are expected soon; one pair weighs 50 tons, and will cut a bar of cold iron 6 inches square. A powerful crane that will hoist 20 tons is in position. At the north end of the mill is a scrap shed which will be 30 x 180 feet.

Alongside the scrap shed a spur track will be built. The shed will hold six cars, and the floor of the mill will be just the hight of the floor of a car, so that stock can be wheeled from the car into the scrap iron shed to the big shears, thus doing away with any extra handling of material, and also saving much valuable time. As soon as the muck mill is in operation the company will begin work on a new finishing department mill, which will occupy the ground adjoining the present new structure, and will be 180 x 300 feet.

The company's present works resumed operations some time since, after having been closed for repairs, and will be in steady operation for the next year, unless compelled to close down for unavoidable accidents. In the past ten months 30,000 tons of finished iron have been shipped, and last week over 50 cars of stock were unloaded at the mill. The company now have on hand

6000 tons of scrap iron and 2000 tons of pig iron, and are unloading from 10 to 15 cars of scrap each day. When all departments are completed and in full operation the plant will employ from 900 to 1000 men.

The Manufacture of Soft Center Steel.

BY G. P. BLACKISTON, PITTSBURGH.

Volumes have been written upon the manufacture of crucible steel, especially that of the tool grade, but the pens of the numerous authors have devoted but little ink to the subject of soft center steel. From this grade we secure, in an indirect manner, the most nutritious of our food. The plowshare, which in olden days was forged into swords to defend our native land from the enemy, and which to-day rubs Mother Earth in such a manner as to give us corn, wheat, oats, &c., is one of the greatest uses to which this special grade is devoted. The writer could name over quite a list of uses to which it is applied, but as space is dear and time short he will simply state that, when a very hard surface is required, which will receive jolts and uneven strains that would be very apt to break it into pieces, it is given a center of iron or soft steel, which transmits elasticity to the entire piece.

But before going into detail and giving the severe and numerous specifications which this steel has to live up to, we will look into its manufacture, which is one of the most important points. The crucible process is the method used to convert the iron and steel scrap into the required grade of steel. The charge, composed of a certain amount of iron and well selected steel scrap, together with the medicine, is placed into the crucible or pot, as it is termed, which is made of blacklead and clay. The pot, with its charge, is, in turn, placed into the furnace, which is so constructed as to allow the flame and heat to play around on all sides.

After being exposed to a heat of 3000 degrees for a period of three to four and a half hours, the contents, or charge, being thoroughly melted, are ready to be withdrawn from the furnace and the molten steel cast into ingots. It is at this point that great care must be exercised. The molds are, as a rule, about 10½ inches wide, 18 inches long and 3 inches thick. A center plate, composed of iron or soft steel, is placed so as to stand up in the center of the mold lengthwise, dividing it into two equal parts.

Two methods are in use to hold this plate up perfectly perpendicular. One is by having a groove, the size of the thickness of the plate, cut into the mold and thus slide it in. The other method is by using a lug, a piece of steel which slips over the side of the mold, the other end holding the plate in place. By the former all of the plate that is in the groove is so much scrap and thus runs the cost up. In the latter the plate is very apt to be a little on one side at the bottom, not perfectly in the center, as by the first method. Of course this would ruin the ingot. Thus there is a splendid opportunity for improvement in this line.

Before going further we must look at the center plate. This should be of good, clean wrought iron, but open hearth steel, with the carbon not above 0.10 per cent. and the phosphorus under 0.03 per cent., can be used with perfect safety. The plates vary in thickness with the ideas of the steel manufacturers, but they are about 1 inch thick, the other dimensions being those of the mold.

The greater amount of the plates used to-day are bought by the carload. The manufacturer should then be very careful to test six or eight plates from every car. A piece should be forged down to ⅞ inch square and quenched in cold water at a bright heat (not a welding or burning one). It should then bend, in this state, over a ¼-inch round bar. If it does not break or crack there is absolutely no danger in its use.

Now that the quality of the plate is satisfactory it is taken to the pickling house, where the plates are inspected for slivers. If any are present they are chipped out. Afterward the plates are scrubbed thoroughly in water with a brush. They are then placed into a bath of water and sulphuric acid, which eats all the dirt from the surface. After remaining in this bath for many hours they are removed and again scrubbed with water in order to remove the acid. This is all done to facilitate the welding of the steel and plate when they come together in the mold. If the plate is at all dirty or has oxide upon the surface the ingot will be unsound, as the steel and plate will not unite perfectly.

But to go back to where we left the pot, just in readiness to have its contents teemed or poured into the mold. The melter picks up the pot with his teeming tongs and teems the metal into the space between one side of the mold and the center plate. At the same time another man pours the contents of another pot into the other side of the mold. The mold is thus left until the ingot is solid. In this manner the ingot is composed of one solid mass, iron in the center and steel on the outside. The carbon being of about 1.30 to 1.50 per cent., the contraction is very great and the possibilities of the ingot cracking are also great.

It is at this point that the majority of steel melters and manufacturers meet with a stumbling block. The writer has seen many cases in which they have simply removed the ingots from the molds and allowed them to cool in the air. The result is a great loss from cracks. Some bury them in ashes or coke dust, but the best method, if results and cost have any power of deciding the matter, is to have a small hole in the casting pit, opening into the top of the cellar. The ingots, as soon as removed from the molds, are thrown through the hole into the warm cellar. Here they are annealed or cooled very slowly, which relieves the ingot of the very strong and sudden strains that result in cracks. The cellar can also be utilized for washing and fixing the pots over and then have everything out of the way. A hydraulic elevator could easily be erected for lifting them out.

After they are thoroughly cool the ingots are brought to the surface and a corner taken off, in order that the carbon may be determined. They are then sent to the mill, where all the good work done up to this time can be destroyed if they are not properly handled by the heater and roller. Being a very high carbon steel, care should be taken not to give them too much heat, but at the same time they should be heated slowly and thoroughly. After being cogged the steel should be taken, without allowing it to cool, and heated for the finishing rolls. There is no danger of edging it, which naturally saves a great quantity of steel from going into scrap.

Just as soon as it is warm enough to handle with tongs the plates should be marked out for pattern and sheets cut to the desired length. These sheets or slabs, if we may be allowed to term them such, are laid upon coke fires in order to keep them warm. They are then cut to the desired pattern. If this shearing was performed while the plates were cold the hard steel would crack or separate from the soft. Great care must be taken to have the surface clean and smooth, as the manufacturers of the plows give it a very high polish. The analysis is about the following: Carbon, 1.30 to 1.50 per cent.; manganese, 0.35 to 0.45 per cent.; silicon, 0.20 per cent.; phosphorus, 0.04 to 0.06 per cent.; sulphur, 0.02 per cent.

Statistics of Swedish Productions in 1901.—The *Bulletin* of the American Iron and Steel Association has received through the courtesy of General Director Richard Akerman of Stockholm statistics of the production of coal, iron ore and pig iron, and of various forms of finished and unfinished iron and steel, in Sweden in 1901, together with information concerning furnaces in blast. The figures are as follows, in metric tons: Coal, 271,509 tons; iron ore, 2,795,160 tons; pig iron, all charcoal, 528,375 tons; blooms produced from pig iron in charcoal hearths, 164,850 tons; Bessemer ingots and castings, 77,231 tons; open hearth ingots and castings, 190,877 tons; crucible ingots and castings, 1088 tons; blister steel, 701 tons; bar iron and steel, 152,183 tons; nail and wire rods, band iron and steel, 89,135 tons; other shaped iron and steel in bars, 6282 tons; plates, not including sheets, 13,856 tons; tube blocks, hollow blooms and billets, 14,333 tons; number of furnaces in blast, 139; average daily product per furnace, 13.96 tons.

Electric Driving for Shops *

BY C. A. SELEY, MECHANICAL ENGINEER NORFOLK & WESTERN RAILROAD.

Electric driving is of special value in old establishments that have outgrown their original plan, or those which could be enlarged or rearranged in reference to economic movement of material, provided a satisfactory solution of the power problem was offered. In many old shops additions have been put on and line shafts unduly lengthened, an engine put in here and a boiler there. The cost of these auxiliaries is not so great, but if we look into the cost of daily maintenance, the extra attendance, the handling of fuel when distributed to a number of points, handling of ashes, the low efficiency of small isolated plants, the general waste of supplies when drawn for a number of plants scattered here and three, and carefully analyze the cost of each of these items, it will often be found that the fuel charge is by no means the greater portion of the cost.

The Roanoke Shops.

An example of an old shop very largely added to and employing auxiliary steam and power in several departments is the Roanoke shops of the Norfolk & Western Railway Company. These shops were built in the early 80's, on a liberal scale, and fortunately were laid out so that additions consistent with the general plan could be made. By June, 1901, the work required at Roanoke had developed to an amount that important additional buildings were planned, necessitating also a general revision of the power transmission which should also check the waste due to the several plants. An unfortunate delay in the delivery of some of the machinery has, however, hindered the construction and starting up of the plant, so that some data is not available at the time of writing.

In order to give an idea of the size of the Roanoke shops, it may be stated that they take care of the medium and heavy repairs of nearly 500 locomotives, mainly of the consolidation type, build complete one 21 x 30 consolidation engine per month, and of cars about 1000 per year, and also the repair work of 1600 freight cars per month, the entire passenger equipment, heavy repairs and considerable building of new passenger equipment, miscellaneous road work, switches, water station and coal pier work, &c., of a 1600-mile road, including all foundry work for the same, as follows: 950,000 pounds of brass and phosphor bronze castings, 44,000 pounds of white metal, 5385 tons of gray iron castings and 43,000 car wheels.

The various power plants at these shops in June, 1901, were as follows:

Shop.	Boilers. Nominal rating.	Engines. Nominal rating.
Machine shop	270	200
Electric plant	..	170
Smith shop auxiliary	60	..
Smith shop auxiliary furnaces	96	..
Erecting and boiler shop	90	20
Erecting and boiler shop	..	30
Foundry	60	40
Planing mill	260	225
Frog and switch shop	50	30
Rail saw mill	..	50

From this table it will be noted that there were two principal power plants, one in the machine shop, which furnished power to a number of shops, and one in the planing mill, whose boilers furnished steam for various purposes. Besides these there were five auxiliary plants of boilers or engines, or both, making a sum total of 880 nominal horse-power of boilers and 775 nominal horse-power of engines for shop power, heating and lighting, the latter service extending beyond the shop's inclosure and furnishing all night and such day lighting as was required for lighting general offices, hotels, depots and yards.

Thus it will be seen that a varied, scattered power service had been built up, and to take its place a new plan must be made which should take into consideration the concentration so far as possible into a central power station of such an amount of power as would do away with all auxiliaries, thereby securing economy of fuel in generating steam, economy of handling fuel and ashes, in operating force and expense for supplies and repairs. In this plant the change had to be made without interference with the operation of the shops or lighting plant.

New Power Plan.

A careful study of the situation developed the following plan: To provide a new boiler plant capable of developing steam for all power needed, save and except only such as could easily and with certainty be made by refuse from the planing mill with practically no extra cost of handling, the object being rather to utilize a means, without wasting it, of burning refuse.

In large electric installations the center of electrical distribution is an important point to find, and the generating plant should be placed near thereto. In shop plants this is not always the ruling factor and it may pay to use a little more copper and place the plant where other considerations are of more importance. In this case the utilization of a large brick stack of sufficient capacity and the location of an elevated trestle for directly dumping hopper cars of coal indicated the location of the new boiler house, which was planned for the immediate installation of 600 nominal horse-power of boilers and reserve of 400 horse-power additional. In a more northerly location additional boiler capacity would be needful in winter for an establishment of this size.

These boilers are in 200 horse-power units, it being believed that smaller units do not give a like economy and that it would not be wise to have less than a two-thirds capacity to fall back on in case of the failure of any one boiler. It is deemed unnecessary to go into detail as to the boiler arrangement, stack and smoke connection; their general arrangement is shown on the plan of the works herewith. The boilers have been installed and connected to the old system of steam piping, and have been operating for some months in a very satisfactory manner, and some considerable economy of fuel and maintenance has been secured thereby.

Instructions Regarding Electrical Equipment.

The direct current system of electric transmission of power and lighting was adopted, using two-wire 220-volt current for motors and three-wire system for lights. This was determined upon after visiting a large number of plants.

Instead of preparing a set of specifications requiring a definite arrangement of the electrical machinery, it was thought best to issue an invitation to the electrical companies to tender on such forms of apparatus as in their opinion would best suit our needs, these needs being fully set forth for their information.

The instructions relative to the general layout read as follows: "There are to be three generators, each direct driven by a compound, noncondensing engine. Inasmuch as two voltages are desired—namely, 110 volts, three-wire system, for lighting, and 220 volts for power circuits, the arrangement and design of these generators may be proposed in more than one form, to permit delivery of current from the switchboard of either power or lighting voltage from any combination of the generators." A schedule of the power and lights probably required was then given, covering the 24 hours. The instructions then proceed; "All generators must be of the latest and most improved type. They must be guaranteed by their makers to develop electrical energy specified, and the guarantee should state the electrical efficiency and also the limit of heating with the rated load."

The system of shop lighting has been series, constant current, double carbon, open arc lamps for general illumination and 110-volt incandescent lamps on alternating circuits. The new system puts the power and lights on the same current, using more than one unit for generating, lessening thereby the probability of a breakdown affecting the continuity of service.

Direct Current Adopted.

Direct current machinery was chosen on account of its applicability to all the classes of service required,

* Abstract of paper presented at the June meeting of the American Railway Master Mechanics' Association.

and for three principal reasons: 1, For use in crane service, as being best adapted to that work; 2, by reason of the slower speeds of direct current motors, they being more readily directly belted to line shafts and machines without the use of intermediate countershafting; 3, alternating current motors are very enticing on account of their simplicity and ease of repair, and I have no doubt that their makers and users have very convincing arguments for their adoption and use; they are, however, far more expensive per horse-power than direct current motors. Great care has to be taken in wiring for the alternating current systems to avoid trouble and losses from induction and cross currents. No trouble of this kind is experienced with the direct current if care is taken to properly proportion the wires for their load and the ordinary precautions in regard to insulation are followed. The alternating current certainly has its field in long distance transmission, where a cheap source of power can be reached and by high voltage be economically transmitted. In such a case the final voltage and its mode of distribution must be determined by local conditions and with special reference to the work to be done.

There, were, therefore, electrical, mechanical and financial reasons that determined the use of direct current transmission in the shops I have named. The plan of the works shows that the power station is by no means the center of distribution, the greatest radius being about 2000 feet, and it required a 700,000 C. M. cable to transmit the power necessary at the mill. The investment in such a cable, however, was far less than it would have been to install the power house at an intermediate point so as to reduce this radius and the weight of the copper required.

Switchboard.

The bidders were requested to fulfill the following conditions in their tenders on the switchboard: "The switchboard to be of marble, provided with one ammeter and one voltmeter for each generator; two recording wattmeters (one for each side of the three-wire circuits); one recording wattmeter for power circuits. To have also automatic cut outs for guarding against overloads; lightning arresters, and the necessary fuses. Triple bus bars are to be provided for light circuits and double bars for power circuits, and suitable switches are to be provided to throw the current from any generator to either the lighting or power circuits, and in addition to these there should be a main switch for throwing the two sets of bus bars together. Contractors are requested to furnish a design of switchboard embodying these features and in addition such feeder panels and switches as seem necessary to operate the plant, taking into consideration the plan of the works and the distribution of power and lights as stated.

"It is desired that the switchboard be of neat design, with all instruments, switches and other attachments first-class in every respect. It is desired to incur no unnecessary expense in elaboration, but to provide every facility for convenient operation, safety and accurate electrical measurements and records. The wiring between the generators and switchboards to be of heavy copper, braided, rubber-covered cable run below the floor in conduits."

A complete plan of the works and yards and the probable amounts of light and power for each location were furnished bidders upon which to base their recommendations and proposals.

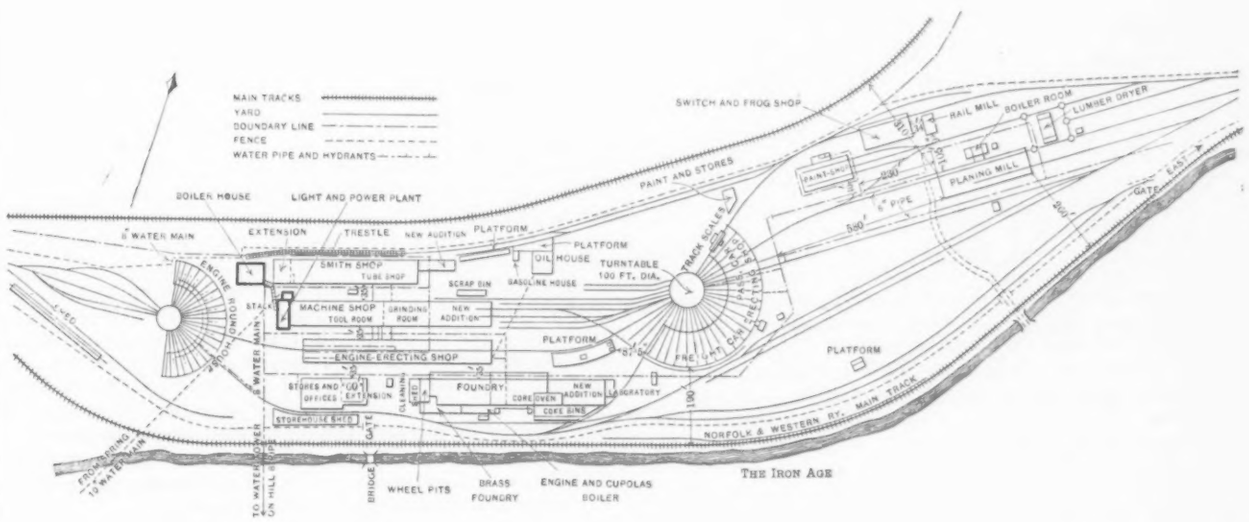
Plan Adopted.

The plan finally adopted comprised three generators, one 75-kw. and two of 160-kw. each. The smaller unit being approximately 100 horse-power and the larger ones something over 200 horse-power each, it will be seen that by combinations of the generators, 100, 200, 300, 400 or 500 horse-power may be transmitted to the board. This is believed to be good steam engineering, as it affords an opportunity to work the engines closely within their most economical range of steam using.

The three-wire system of lighting generally requires two generators to be worked in series, but in this plant, for considerations of simplicity, first cost and general convenience, and for the further reason that the plant is primarily a power plant, the arrangement and voltage of the generators were fixed with a view to all these considerations and operated direct to the board at 220 volts. This being also the proper voltage for the outside wires of the three-wire system the means of maintaining proper balance between the two sides was then considered and arranged by using a motor generator balancer set of 10-kw. capacity. This machine has its controlling switches on a panel of the switchboard and in a simple manner maintains the balance of the two sides, correcting any inequality of current pressure there may be, due to one side being more heavily loaded than the other.

If the plant was primarily for lights this plan would not have been adopted, as in that case 110-volt generators, in multiple for lights and series for power, as in the Chicago & Northwestern power plant, would be advisable. Care being taken in the distribution of the lights on the circuits, the balancer has little to do and is a simple and effective device. The shops are to a considerable extent wired and equipped with incandescent circuits, 110 volts, alternating current, and it is only necessary to straighten out and extend the service, transferring the feeders to the new switchboard.

General inside illumination is provided for by the use of 110-volt inclosed arc lamps on the same circuit as the incandescent lamps, the arc lamps having opales-



ELECTRIC DRIVING FOR SHOPS.—ROANOKE SHOPS OF NORFOLK & WESTERN RAILROAD.

cent single globes and sheet iron shades painted white. It is believed that this style of arc lamp is best suited for shop lighting as against the use of double glass globes with no shades. The shades distribute downward a portion of the light that would be otherwise wasted upward and do not interfere with the lateral distribution of the light.

Group or Individual Motors.

The question how far individual motor driving should be considered for machines is an interesting one, but it is the belief of the writer that it is not necessary or advisable to consider anything but group driving in the average railroad shop.

There is one shop that has been considerably exploited by the consulting electrical engineer who laid it out, that is a shining example of the extreme in individual motor driving. The published descriptions of this shop state that motors of the following horse-powers are installed: 1, 2, 3, 3.5, 4, 5, 6, 7.5, 8, 9.5, 10, 13, 15, 17.5, 20, 22.5, 25, 35 and 45 horse-power. There are 94 machines listed, excluding cranes, turntables, &c., driven by 68 motors. The machine shop shows 42 machines driven by 29 motors. The arrangement is such that if another machine were to be put in a motor for it would be required. In the Norfolk & Western machine shop there are 133 machines, which will be group-driven by 6 motors, aggregating not over 100 horse-power.

A machine may be added to any group without seriously overloading the motor, and as there are several groups we may add a number of machines without change of motors. The additional load would be shown at the switchboard, but by reason of the group system it would add but a small amount to any one motor.

The reasoning in favor of group driving of railway shop machinery is on this wise: One machine requiring 1 horse-power may be taken as a unit; individually motor driven, this machine would take a 1 horse-power motor to operate it, even if it ran but one-half the time, and average machine tools are idle or running light at least that amount for work or tool adjustment. Two or three such tools grouped would not require their full multiple of the unit power, but the full value of grouped driving will be reached, 1, when the number of machines in the group will enable the use of a motor of sufficient size for a near approach to good electrical efficiency, which is not possible with small motors; and 2, when the number of machines is such that the proportion of idle time may be so distributed over them as to be practically continuous and effect a proportionate reduction in the power needed in the motor. For example, if one unit takes 1 horse-power and is idle one-half the time, two such units can be driven by a 1 horse-power motor, provided the machines are run alternately, but if both are operated together the motor will be subjected to 100 per cent. overload. If we take ten such units, however, and use a 5 horse-power motor, the chances are about even that the motor will be driven to its rating, and they are infinitely small as to its ever getting 100 per cent. overload. There is no argument against individual motor driving in case the machines to be driven are large enough or if their isolation is necessary to facilitate movement of material, but we are considering average railway shop machinery, and in most cases old machinery already group driven from shafting.

The extremist in electric driving does not like to use shafting, but as against an almost 100 per cent. increase of total motor capacity required, the low electrical efficiency of small motors and also the high cost per horse-power for small motors as compared with those of moderate size and power, a reasonable length of shafting will in the end prove the best investment for our class of work. In a wood planing mill the case is somewhat different. The power required is so much greater for heavy planers and other continuously operated machines that individual driving may be attempted, but even here it may profitably be limited. Saws, shapers, jointers, mortisers, tenoners, band saws, borers, all intermittently operated machines, can be successfully grouped and driven with a fraction of the power required for individual driving.

From the table it will be noted that the mill was equipped with a large engine. An indicator test showed the average power required, including all friction, to be 160 horse-power, although for short intervals it ran a little over 200 horse-power. It was believed that, by the elimination of the engine friction, the heavy transmission belts and certain unused lengths of shafting, 125 horse-power of motors would operate the mill, using seven motors driving 40 machines, all on the group system. It was decided that it would be wise, however, to overrun the calculated power at the heavy end of the shop somewhat and 140 horse-power of motors were ordered.

Other departments that are to be motor driven in groups are the smith shop bolt and forging machinery; the forge blowers, together with the flue shop machinery; the bolt and nut cutting machinery, together with the smith shop punching and shearing machinery; boiler shop machinery; the foundry rattlers, grinders and drilling machinery in two groups, and the foundry cupola blowers are also to be driven with a motor with rheostatic control for varying the speed according to the need for blast. In all, 23 motors were ordered, as follows: Three 7.5 horse-power, five 10 horse-power, three 15 horse-power, ten 20 horse-power, one 30 horse-power, one 35 horse-power, aggregating 382.5 horse-power. It will be noted that the 20 horse-power motor is ordered in a larger quantity than any other size, it being intended that this should be the standard motor so far as possible. All motors are of the regular commercial type, standard with the manufacturers.

The above described motors are in all cases to be directly belted to line shafting. The writer has seen motors directly attached on the end line shafting, as at the General Electric Company's shops at Schenectady. At another shop back geared motors were used directly attached, but the gearing was very noisy and neither of these plants employ strictly standard motors.

At the Baldwin Locomotive Works, where both individual and grouped driving are very extensively used, belts are used to the greatest possible extent and in many cases with such short belt centers as to be surprising that good results could be obtained. It was explained that this method was very satisfactory and that after a belt was taken up a few times, in most cases it would run thereafter almost indefinitely, and if it did fail, its replacement was much easier, cheaper and speedier than to repair broken gearing.

On the other hand, many shops employ gear connections between their motors and machines, especially the modern heavy machinery, much of which is now built to be directly driven. Where the gearing can be covered and protected it may do very well, but wear is inevitable and gear breakages are expensive and at times exceedingly inconvenient. There is a very desirable flexibility in a belt connection, and if there should be a failure of the motor an extra one can be readily installed if standard types are employed. Some of the electrical companies have developed systems of multiple voltage which, in connection with double or triple gearing, give a large range of adjustment of cutting speed of tools individually driven, enabling maximum output after proper speed has been determined by experiment. These systems involve the use of considerable gearing, additional wiring and a generating set arranged with reference to the number of the voltages desired. Some of our friends who have installed multiple voltage may be able to enlighten us as to its advantages, but as the writer does not favor individual driving as a rule, multiple voltage was not considered in connection with the plant under discussion.

The description so far has reference only to the regular motors for power purposes to be used at Roanoke shops. In addition to these, various situations have been considered and electrical power planned. Some of these are as follows: The substitution of a motor instead of a rope drive for the machine shop walking crane, which operates on a center track running the length of the machine shop and serves heavy tools adjacent thereto. A railway motor and controller is to displace a steam engine and boiler driving a turn table. A

new 40-ton three-motor crane with a 5-ton auxiliary hoist was installed in the erecting shop, and a 25-ton rope driven crane is to be reinforced to carry 40 tons and be electrically equipped in a similar manner to the preceding crane for use in the erecting and boiler shops. A rebuilt crane of 15 tons capacity is to be installed in the foundry, dispiacing a hydraulic crane which could operate over but a small area, while the traveling crane could cover a large portion of the foundry floor. It is probable that in the near future a second turn table, now hand operated, will be electrically operated, and that electrical power will be furnished the general office for elevator service.

Worcester Manufacturing News.

WORCESTER, MASS., July 28, 1902.—The Washburn & Moen Department of the American Steel & Wire Company is to add new colors to the product of its copperas plant at the South Works as soon as the new buildings now being erected for the plant are completed and equipped, which will be within a few weeks. New processes will be used in the manufacture of colors from the sulphate of iron, or copperas, procured in the cleansing of wire with acids. By the new process a greater luminosity will be given the Venetian reds, which will be manufactured in a number of new shades and tints, in addition to those already produced. The volume of production will not be increased, Venetian red being only a by-product of the works, but the new process will add greatly to the money value of the product.

The Morgan Spring Company are installing a new 150 horse-power boiler, from the Stewart Boiler Works of this city, at the plant at Barber's Crossing. The additional steam is not needed for power, but for use in various processes of wire manufacture. The company are manufacturing a new line of springs for use in cushions and for similar purposes. For the past fortnight samples of these springs have been on exhibition at the Furniture Exchange Building, New York, where they have attracted much attention. The springs contain some new features, which the officers of the company believe will attract a large business.

A building permit was taken out last week for the new foundry to be built at the Washburn shops of the Worcester Polytechnic Institute. The structure will be 52 x 90 feet, and the equivalent of three stories in hight, a monitor roof 10 feet high surmounting walls 20 feet in hight. The building will be of brick on granite foundation, trimmed with freestone. One or more electric cranes will travel the length of the building, covering a space corresponding to the 20 feet width of the monitor. There will be a gallery along one entire side of the building. Under the central portion of the gallery will be two cupolas, one 26 inches, the other 36 inches in inside diameter. Here will also be located the crucible furnaces. There will be a brass foundry as well as the iron foundry, the latter occupying the main portion of the building, which will be open to the roof. Great pains have been taken to secure the maximum of light and ventilation. The heating apparatus blower will provide cold air in summer as well as warm in winter.

A company are forming in Worcester to manufacture an adjustable circular saw, the invention of Frank A. Humphrey. Most of the stock of a $50,000 Massachusetts corporation has been subscribed, the subscribers being for the most part prominent steel and iron manufacturers. The Humphrey saw table is easily adjusted to saw at any desired angle. The machine is said by experts to possess remarkable mechanical features and to be exceedingly practical.

The "No Help Wanted" sign again hangs at the doors of the big shops of the Prentice Bros. Company and the F. E. Reed Company. The end of the machinists' strike soon filled the shops again, and everything is rushing full blast. The Prentice Bros. people are especially busy finishing up orders delayed by the strike, which hit that concern more than any one else. Worcester can now boast again that there is not a strike, little or big, within its limits, which is the normal condition of things here.

Local manufacturers of machine tools disagree as to the effect of the increase in price of tools upon business. Several of them assert that it makes no difference. One or two say, on the contrary, that it makes a difference for the worse. However, inquiries and orders are coming in rather more rapidly than usual for this time of year.

Waldo H. Lamb is to move his wire business from Northampton to Worcester. He has leased a building on Hermon street, which will give him 10,000 square feet of floor area. He manufactures principally piano, broom and mattress wire. He will employ 15 or 20 men to start with.

Albert R. Webb has been appointed head of the spring department of the Washburn & Moen department, to fill the vacancy caused by the death of Charles B. Sanford. Mr. Webb has been assistant to Charles M. Booth, head of the flat wire department, and has been with the Washburn & Moen Works for a number of years.

The H. E. Pender Machine Company is the name of a new firm who have established themselves in the N. A. Lombard Building on Union street. The firm consist of H. E. Pender, William Brown and R. G. Jeffrey, all of them experienced in the manufacture of wooden machinery. The firm will manufacture all sorts of cloth finishing machinery. The first machine has already been sold to a mill in Willimantic, Conn.

William H. Whitney, Clark University's expert instrument maker, has found what is claimed to be a perfect solder for aluminum. He keeps the composition of the flux and the liquid with which the surfaces of the metal are cleansed preparatory to soldering a secret, and will immediately take out a patent upon his discovery. The savants of the university assert that the solder withstands tests made to demonstrate its weakness if any exists. It is even claimed that the solder has the same strength as the metal itself. Mr. Whitney has used the solder extensively in instruments of which aluminum is an important feature, especially in connecting sections of aluminum wire. J. N.

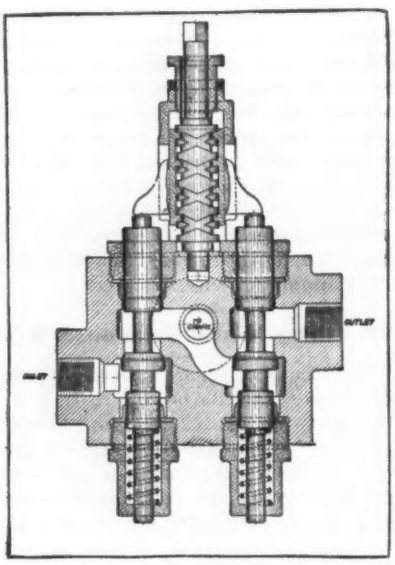
The Norton Emery Wheel Company's New Shop.

The Norton Emery Wheel Company, Worcester, Mass., have erected at Barber's Crossing a wooden building, 80 feet wide by 152 feet long, with monitor roof. The distance from floor to roof of monitor is 31 feet. There is a gallery on either side and at the north end of the building. On one of these galleries will be manufactured the small parts; the other side will be devoted to commercial grinding. The distance from the ground floor to floor of gallery is 14 feet; from the gallery floor to roof, 12 feet. The main floor will be used for erecting purposes and for heavy planing, milling, drilling, &c. The shop is equipped with a 10-ton electric crane, with 40-foot span. On each gallery is located a 30 horse-power motor for driving the main lines. A railroad siding from the Fitchburg division of the Boston & Maine enters the south end of the building under cover. The tracks are depressed, so that the floors of cars will be level with the main floor of the machine shop. Finished machines can be picked from the floor with the electric crane and placed in or on cars for shipment. All materials and machinery can be unloaded from cars in the same manner. Everything in connection with the shop has been planned with a view to the greatest convenience and economy. The shop is very light, being practically all glass above the sills, which are of brick.

This shop is to be devoted exclusively to the manufacture of the special Norton grinding machines for cylindrical work. They are made in two sizes, the larger being designated as 18 x 96 inch—that is, it will take in 8 feet in length and 18 inches in diameter. The small machine is designated as 12 x 72 inch, and takes in pieces 72 inches long by 12 inches in diameter. Machines of both sizes are now in use in some of the leading manufacturing establishments of the country, and a number have also been sent to Europe. Without exception they are giving excellent satisfaction, and the demand is rapidly increasing. Duplicate orders have also been received, one customer having ordered four of them and another ten. Electric power is used, which is supplied from the company's central power house.

The Dyblie Hydraulic Valve.

We very much regret an error which occurred in our issue of July 17 in the description of a three-way hydraulic valve. This article was titled the "Public" hydraulic valve, which was an error. It is made in accordance with patents issued to J. A. Dyblie, the right to manufacture having been acquired by Monahan Bros. of Joliet, Ill. It is particularly adapted for crane service. The four-way valves are made with four plugs or pistons. The operating screw is cut compound with a right and left hand thread, and the nuts are in two and four sections for three and four way valves, respectively. The right hand nut descends while the left hand nut ascends, or *vice versa*, by moving the lever one way or the other. The use of this screw eliminates all slamming of flanges and water hammer, the result being the absence of shock to pipes and connections. It is also practicable to use metallic seats which have a long life. If for any reason the valves become cut, reseating can be done in a few minutes by using a reseating coil, or the old one can be replaced by a new one without disturbing the valve. The leather cups used for the packing plugs will give service for months, as they are subjected to very little wear. The valves are



THE DYBLIE HYDRAULIC VALVE.

easily operated and balanced. The smallest motion of the lever will reverse them and a piston in a cylinder can be moved fractions of an inch either way and loads held on the crane indefinitely without the attendance of an operator. There can be no leak in the valve which the operator cannot discover.

The Youngstown Iron Sheet & Tube Company.—The annual meeting of the stockholders of the Youngstown Iron Sheet & Tube Company was held in Youngstown, Ohio, last week. The stockholders were well satisfied with the report of the operations of the company submitted by James A. Campbell, general manager. The stockholders elected the old board and one additional member besides. The board, as it now stands, is as follows: Myron C. Wick, Robert Bentley, C. D. Hine, H. M. Garlick, William Wilkoff, James A. Campbell, H. H. Stambaugh, George L. Fordyce, all of Youngstown, and Harry Dalton, J. L. Severance and James Parmelee, Cleveland. The directors passed the election of a new president to take the place of George D. Wick, who retired when he went to Europe several months ago, deferring action on this office to a later meeting. The other officers elected were: James A. Campbell, general manager and vice-president; W. H. Foster, secretary, and Richard Garlick, treasurer. It was decided to elect an Executive Board for the company, and the members to constitute this board chosen were: Robert Bentley, H. H. Stambaugh, James A. Campbell, Richard Garlick and George E. Day. The last named gentleman, formerly of Casey & Day of Chicago, has also been made general sales agent. It is the intention of the company to erect a large basic open hearth steel works at Youngstown, and plans for the new works are now being prepared.

Notes from Mexico.

The Rainfall.

DURANGO, MEXICO, July 22, 1902.—In Mexico, as elsewhere the ranchero, or farmer, is the important factor in determining the country's meed of prosperity. Rains have been general and copious throughout most of the States for some weeks past; consequently fears in regard to a possible short crop of the cereal staples have disappeared. In the northern corn growing States, at least, a fair yield is assured. In the State of Durango, which, on account of its stock raising interests no less than its great mining activities and important manufacturing enterprises, is directly affected by a shortage of water, there have been successive downpours. The stockmen have been relieved from anxiety and at the same time storage tanks and other artificial methods of conserving the water supply have been overtaxed. Only those who have lived in drouthy countries can adequately appreciate what this signifies.

The Exchange Barometer.

Exchange on New York is quoted to-day at a premium of 138½. A draft on your city for $20.88 cost the writer $49.69 a few days ago. Free silver coinage has its disadvantages.

Permanent Exhibition of Manufactures.

Reference was made in these notes some time ago to the action of certain manufacturers of St. Louis, Mo., who were taking steps to place samples of their products on exhibition in Guadalajara, the capital of the rich State of Jalisco. The result of these efforts will shortly be in evidence, as a permanent exhibition is to be opened in the city named on August 15, in which St. Louis will be represented by a number of manufacturers who are awake to the advantages which Mexico offers as a field in which reward awaits enterprise. A Guadalajara daily has the following notice of the proposed exhibition:

> The permanent Western Mexico Exposition is to be inaugurated here on August 15. President Diaz has been invited to inaugurate the exposition, but it is not known yet whether or not the invitation will be accepted. The exposition will occupy the Mercado Alcalde building, which is centrally located and large enough to accommodate the many exhibits. Products from the State of Jalisco and a number of other States on the Pacific Coast will be kept on exhibition permanently and the building will be open each day from 8 a.m. to 7 p.m. About 15 machinery manufacturers of St. Louis, Mo., have secured space in the building, and will keep their products on permanent exhibition here.

Decrease in Imports.

A perceptible diminution is noticed in the volume of imports into Mexico during the nine months of the current fiscal year, of which the figures are now available. The total value of such imports is $44,378,251, gold, as against $48,037,851 for the corresponding period in 1890-1891. The principal item which contributes to this decrease of over three and a half millions in the sum total of the imports is that of machinery.

Industrial Notes.

The Mexican National Iron & Steel Company or Durango, who suffered severely from a fire which destroyed some of their shops a few months since, have commenced the work of rebuilding.

The Monterey Iron & Steel Company's stock is in active demand at $55 per share, which sum represents the amount paid up on their $100 shares. This company have thought it worth while to make public denial of a report that they would become subsidiary to the United States Steel Corporation.

Mexico exported to England 4743 tons of copper dur-

ing the first half of the current year. The imports into Havre from Mexico in the same time were 3731 tons.

Mexico produced 335 metric tons of quicksilver in 1900. This equals 9650 flasks. J. J. D.

Pacific Coast News.

SAN FRANCISCO, July 21, 1902.—As this is harvest time and as in the country all are concerned directly or indirectly in the work of gathering the cereal and fruit crops, regular business is somewhat slow, although less so than at this time in other years. But a few weeks will remedy all that and then everything will be in full swing again. Most of the farmers of the State have done well, even in some of the coast counties where very little of a cereal crop was looked for. The results have been surprising, and threshing being over, a good yield has been returned. The prices for wheat have been unusually good this year, $3 a ton higher than a year ago, while there is a contest for brewing barley going on between the shipper here and the buyer in England, and the market is $2.50 to $4 per ton higher. On the other hand fruit is a very heavy crop and orchardists are selling for $5 to $10 per ton lower than last year. The crop, however, is so large that in most cases the returns will be as good as those of 1901, in many much better. The returns for the produce of the farm and orchard will be at least $100,000,000 to the growers this year. With such a fund to draw upon there need be no fear of the fall trade.

While more money will go to the hardware and iron trades, it will not show an excess in every line. There may be somewhat of a falling off in the sales of tin plate on the coast unless, indeed, the salmon pack should be much larger, as there is likely to be some falling off in the amount of fruit packed. That, however, will be made up to some extent by a larger vegetable pack. There will be an increase in the amount of cables used on the coast, as every day new uses are being found for them. The works of the American Steel & Wire Company in this city are among the largest in the world, and are kept busy all the time. Wire cables are now being used to haul shingle bolts from rough places in the mountains to the mills, thus taking the place of railroads, and at a comparatively small cost. There are many new shingle mills being put up in Humboldt and Mendocino counties, and they are all being fitted up with shingle machines. All this redounds to the benefit of the East, as they are not manufactured on this coast, and besides these there are a hundred and one other things in the shape of manufactured iron and steel that come in here.

New roads are being contemplated in connection with our oil fields, particularly one over 100 miles long, from the Kern River country to Port Harford, on the coast. This will call for a good deal of rails, &c. There is little doubt that it will be built. Other roads of greater or less length are in contemplation, to lead into lumber districts and to develop oil fields. The demand for steel girders and construction material grows more intense every day. The Merchants' Exchange is about to build a gigantic 12-story structure on California street, reaching also partly into Montgomery, which will cost $1,200,000, and the frame work of which will be steel. And a couple of big office buildings are also named this week that will call each for a large quantity of structural steel, and every week something new in this direction develops, a hotel, office building, &c. I suppose tenants will be found for all these fine offices erected and in contemplation, each one finer than the last, but they seem to fill up somehow and capitalists are not worried a bit over the outlook.

The export movement keeps up well. The "Doric" on the 16th had bicycles, wire, bolts and machinery valued at over $13,000 for Japan, China, the Philippines, Korea and Singapore, while the shipments by the "China" on the 8th for the same destinations were valued at over $12,000. There have been considerable shipments of machinery and barbed wire to Central America and Mexico. A large quantity of pipe and machinery has gone to the Hawaiian Islands. The "Enterprise," for Hilo, on the 18th, had over $4000 in hardware alone. The "Newport" had $2272 worth of pipe for Mexico and the "S. G. Wilder," on the 18th, for Honolulu, pipe valued at $7681. The "Nevadan" had pipe valued at $2881 for the same destination.

J. O. L.

Central Pennsylvania Industrial News.

HARRISBURG, PA., July 29, 1902.—July closes with most of the works in this part of the State in operation, although all are still more or less hampered by the strike in the coal regions and the scarcity of steel and pig iron. Products of furnaces are in demand, and there are many inquiries reported about next year's production. Unless all signs fail there will be a great time in the iron and steel industry in this part of the State next year.

Lochiel Furnace in this city, owned by the Pennsylvania Steel Company, has been stopped for repairs, but will be blown in as soon as possible.

Officials of the Central Iron & Steel Company deny the report that the company will not build the contemplated open hearth department this year. The work has been held back by the delay in material and by other causes, but it was stated last week that the company intended to push the work this fall. The plant will contain six large furnaces. The company are hurrying repairs on their No. 2 Paxton Furnace, and may start it late in August or about September 1. No. 1 is in blast.

The situation at Reading and Lebanon is about the same. The works and furnaces are running fairly well about Lebanon, and repairs are being made to furnaces; but at Reading several foundries have been inconvenienced by the shortage of coke, and operations are not so extensive as a month ago. Two furnaces are also idle at Reading, and in the neighborhood some additional ones may blow out. The strike is keenly felt in the lower Schuylkill and Lehigh valleys.

The old Wilhelm Bicycle factory at Hamburg, a flourishing industry some years ago, is about to be turned into a silk mill. This industry has to some extent taken the place of iron in a number of Eastern Pennsylvania towns.

The Lorain Steel Company have started to rebuild part of the Moxham plant, near Johnstown, and work was started last week on the erection of buildings, which will cost in the neighborhood of $200,000 when completed. The American Bridge Company are doing the work.

Valuable deposits of manganese iron ore have been struck at points in Carbon County, and it is said that a strike, showing about 38 per cent. manganese, has been made. The find was made by the Carbon Mining Company, who sold a large part of the product to a New Jersey corporation.

Lancaster County plants are generally working, and there are busy times ahead. The Christiana Works will be improved, and there is talk of enlargement of an important Lancaster plant. At Columbia all is activity now, and the works of the Susquehanna Iron & Steel Company, which were idle for a time in the early summer, are all going full blast.

The situation in Bedford, Blair, Huntingdon and Centre countries is good, and there are few idle works. Most of the available furnaces in the three counties are working, and in Bedford especially there is no lack of business for the furnacemen. All through the Juniata Valley affairs are prospering. Big improvements are contemplated by the Pennsylvania Railroad at Altoona, and the American Lime & Stone Company will make a number of ventures, which will cost a good deal of money and give a largely increased product. S.

Charles J. T. Burcey of Syracuse, N. Y., has patented a process for charring wood, which is stated to save all by-products, thus greatly reducing the cost of charcoal to iron manufacturers. Mr. Burcey has issued a circular giving results obtained in charring 225 cords of wood per day by his process at Elmer, Pa. The figures given are extremely interesting.

The New Generating Plants of the Niagara Falls Power Company.*

BY H. W. BUCK, ELECTRICAL ENGINEER NIAGARA FALLS POWER COMPANY.

The growth of the applications of Niagara Falls power has been so rapid since the starting up of the first power house in 1895 that the entire 50,000 horse-power of the first plant has been taken up to its limit. This growth was anticipated by the company three years ago, when the hydraulic development of a second plant was started under way. This plant is nearly completed, and within a few months the first generator of its equipment will be performing useful work.

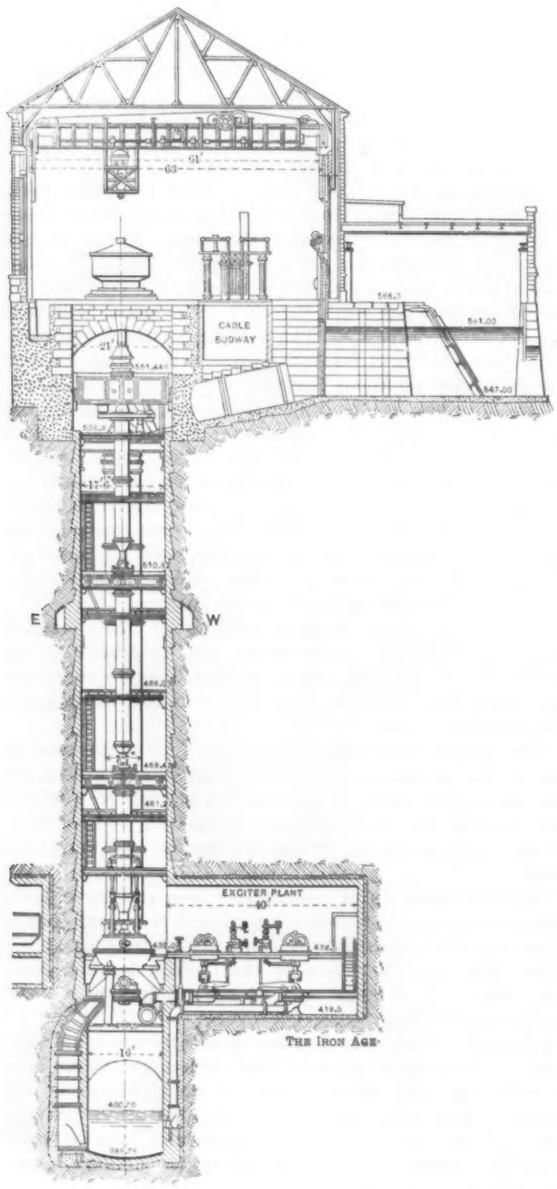


Fig. 1.—Transverse Section through Power House and Wheel Pit No. 2.

This power house, from a popular standpoint, may be considered a duplicate of the old one, with which every engineer is familiar, and differs only in some of its technical details. It is located on the opposite side of the intake canal and nearer to the river, and has its water wheels placed at the bottom of its own separate wheel pit. Discharge water is led out from this pit by a branch tunnel, which, after leading independently for for 11 units of 5000 horse-power each, instead of 10. about 600 feet, joins the main tunnel, which, as is known, has a capacity of 100,000 horse-power. The new turbines are somewhat different from those in power house No. 1, being of the internal discharge type and having the discharge water carried off through draft tubes, which add about 10 per cent. to the effective head. This increase in efficiency gives 10 per cent. more power for the same amount of water as used in power house No. 1, and in consequence the plant is laid out The turbines were designed by Escher, Wyss & Co. of Zürich, Switzerland, and were built by the I. P. Morris Company of Philadelphia. The governors were also designed by Escher, Wyss & Co., and are being built by A. Falkenau of Philadelphia. They are of the oil pump operated type, and give a maximum variation of speed of about 5 per cent. with 100 per cent. load variation, and for fractional changes in load the regulation obtained is about the same as that of a good steam engine.

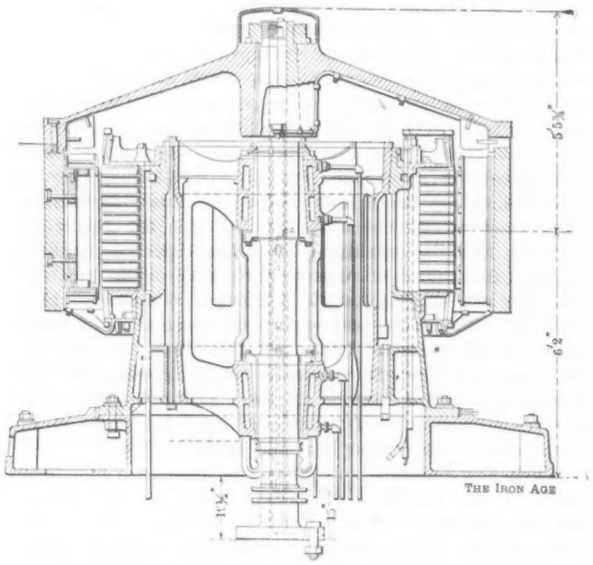


Fig. 2.—5000 Horse-Power Generator with External Revolving Field, Power House No. 2.

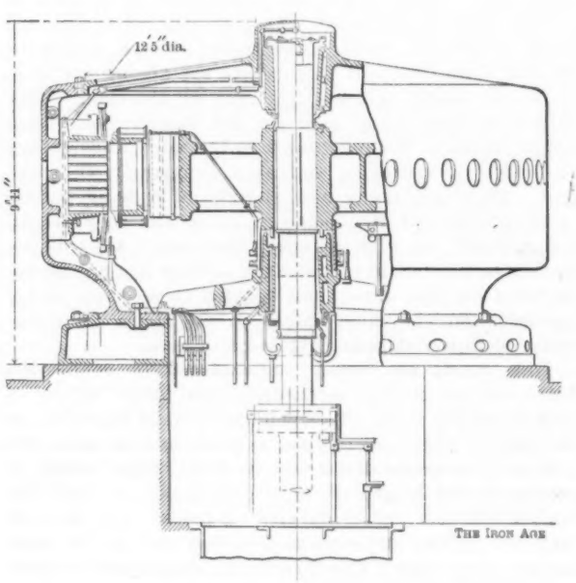


Fig. 3.—5000 Horse-Power Generator with Internal Revolving Field, Power House No. 2.

THE NEW GENERATING PLANTS OF THE NIAGARA FALLS POWER COMPANY.

The electrical equipment is furnished throughout by the General Electric Company. In general, its charac-

* A paper presented at the annual convention of the American Institute of Electrical Engineers, held at Great Barrington, Mass. June 18-21, 1902.

teristics are the same as in the apparatus in power house No. 1. The generators are of 5000 horse-power each (3750 kw.), wound for 2300 volts, two-phase, 25 cycles at 250 revolutions per minute. This type was decided upon on account of its exact interchangeability with power house No. 1. It was considered that the advantages which might result from winding the new generators for a higher voltage would be more than offset by the lack of interchangeability between two power houses located so near together as to be governed by the same conditions.

Electro-technically, power house No. 2 differs in several essential details from the installation in the old

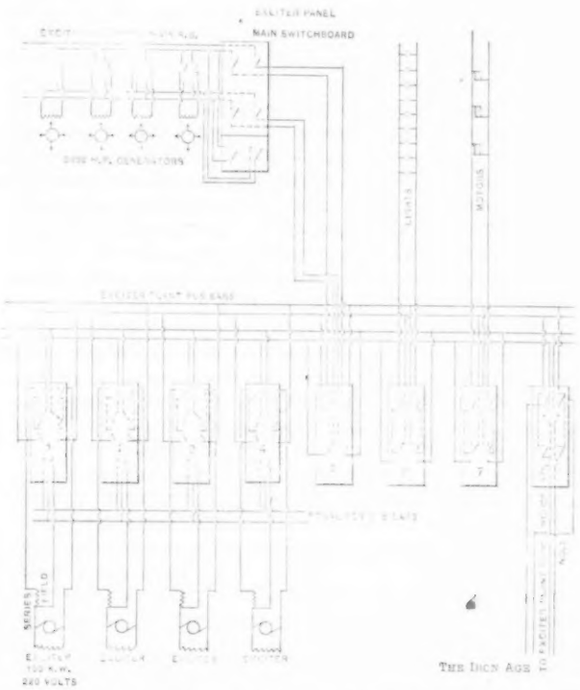


Fig. 4.—Wiring Diagram of Exciter Plant.

new generators is in the matter of regulation, the regulation being nearly three times as close. This closer regulation was adopted in order to insure constancy of voltage on the system with variations in load and also to reduce to a minimum the unbalancing of the voltages on the different phases caused by difference in loads upon them. These points are of great importance on such a system as that of the Niagara Falls Power Company. Many electrical distribution systems are made up of a very large number of small consumers of power, and the actions of any one customer have little effect upon the voltage of the system; consequently, in such cases regulation is not of such vital importance. But the Niagara Falls system is made up of a comparatively small number of very large consumers of power, any one of whom can, by a change in his load, cause a serious disturbance on the circuits. Furthermore, it is unique in one of its characteristics in that much of the power is used on large single-phase electric furnaces, which take their power from one phase only. Since it is impossible to control these furnaces so that at all times the same number shall be in operation from each of the two phases, inequality of load on the phases results and the voltages are unbalanced. This unbalancing is disastrous to polyphase synchronous and induction motors on the system, for the high voltage phase tends to carry all the load, and the windings on this phase are overloaded. The results can be rendered inappreciable only by the use of generators of close regulation.

The armature winding is a two-circuit series closed winding and consists of formed one-turn coils placed in open slots, with two coils to a slot. The conductor is made up of stranded cable pressed into rectangular shapes. This stranding of the conductor reduces eddy current losses in the armature conductor itself which exist in the case of a large solid bar, as used in the old machines. The open slot is also considered an advantage in a machine of such great length of armature core, for in the closed slot it is necessary to drive the armature bar with its insulation on throughout the length of the slot in order to put it in place. The system used in the new machines of interlacing the end windings

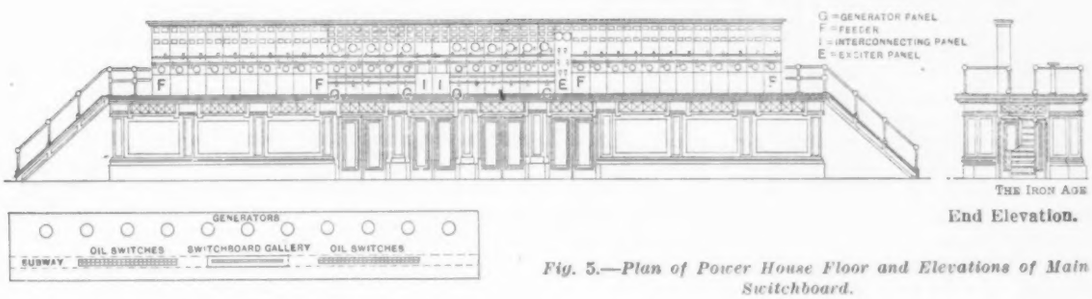


Fig. 5.—Plan of Power House Floor and Elevations of Main Switchboard.

Floor Plan of Power-House No. 2.

THE NEW GENERATING PLANTS OF THE NIAGARA FALLS POWER COMPANY.

plant, the differences being due largely to the advance of the art since the time when the first power house was equipped. The main points of difference are: 1, Closer generator regulation, the regulation on the new machines being 10 per cent. and on the old ones about 30 per cent.; 2, the entire plant will be operated from a single switchboard, instead of two; 3, the feeders will be protected with automatic oil circuit breakers.

Generators.

The first six generators to be installed will be similar in outline to those in the first plant, being of the external field type, with the nickel steel revolving magnet ring. This machine is shown in assembly in Fig. 2. In appearance the most striking difference is in the omission of the iron bridges over the machines. This omission results from the collector rings being placed at the bottom of the dynamo shaft instead of the top.

As stated above, the principal difference in these gives strong construction to withstand the displacement strains caused by short circuits.

The system of ventilation is radically different in the new machines. Referring to Fig. 2, a baffle plate will be seen between the bottom of the armature winding and the bottom of the revolving field. This forces all the air which is actuated by centrifugal pressure to enter the machine at the bottom inside of the armature shell. From here the air passes outward through the air ducts in the armature core, cooling the iron and the winding. It then continues outward radially between the layers of the field winding into an annular space at the back of the field coils and thence outward through holes in the magnet ring, which are bored in line with the pole piece bolts. The action is that of a centrifugal blower caused by the rotation of the field poles and ring. Some of the air also passes outward at the top of the ring through ventilating holes provided for the purpose. The operation of the air system is very satisfactory, and

the blast of air secured is tremendous. From tests which have thus far been made it is believed that these machines will run from 10 to 15 degrees cooler than the old ones. These improvements in design were introduced by W. L. R. Emmet of the General Electric Company, with the co-operation of H. G. Reist.

The generator equipment in this power house is completed with five 5000 horse-power machines of the internal revolving field type shown in Fig. 3. It was decided that the last five machines of the installation should be of this type on account of the much lower cost of building, simplicity of handling and accessibility to

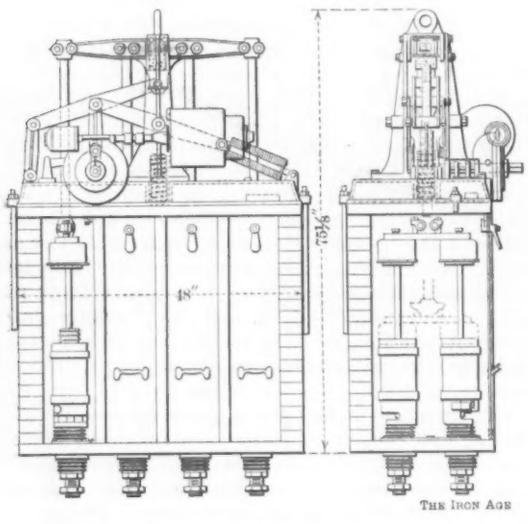


Fig. 6.—Electrically Operated Oil Break Switch.

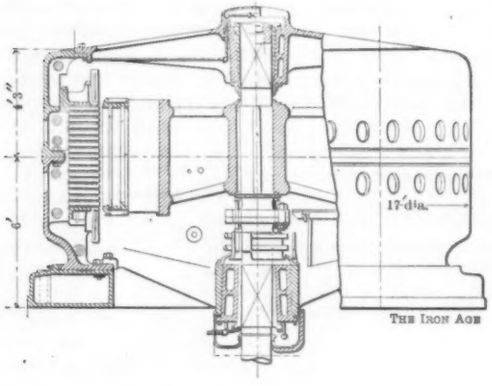


Fig. 7.—10,000 Horse-Power Generator with Internal Revolving Field.

when two alternators of different regulation operate in parallel the resultant regulation is the mean between the two. Idle current between the two types may be prevented by careful adjustment of the field currents.

The guaranteed efficiency of the external field generators was:

	Per cent.
Full load	98.0
Three-quarters load	97.3
Half load	96.0

From actual test the full load efficiency has come out 98.15 per cent., which is probably the highest ever attained in an electrical generator.

Exciters.

The exciter plant in the new power house will be quite different in arrangement from the old one. The installation will be made complete, with the exciter switchboard in a compartment recessed into the rock at the bottom of the main wheel pit, as shown in Fig. 1. This position will eliminate the long shaft necessary with exciters placed on the main dynamo floor, and will simplify the operation of the plant. The equipment will consist of four 150-kw. compound wound vertical shaft 220-volt exciters, each coupled to an independent turbine placed directly underneath. The speed is 750 revolutions per minute, and each exciter turbine is controlled by a separate governor. The exciter plant wiring diagram is shown in Fig. 4. It will be seen that the power house lights and auxiliary motors will be operated from this plant. A panel is also provided for inter-

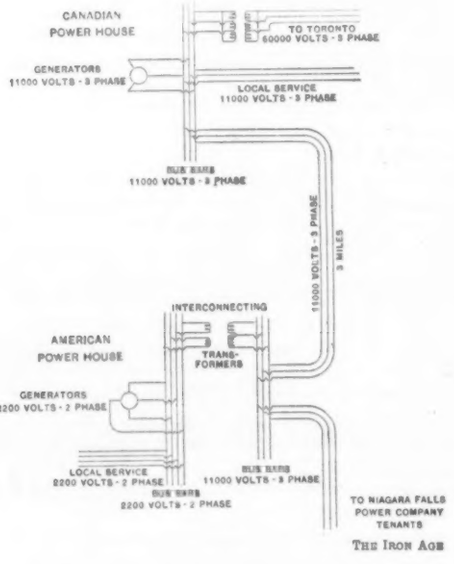


Fig. 8.—Method of Interconnecting American and Canadian Plants.

THE NEW GENERATING PLANTS OF THE NIAGARA FALLS POWER COMPANY.

the various parts as compared with the external field design. These machines are also wound for 2300 volts, 25 cycles, two phase, and operate at a speed of 250 revolutions per minute.

These machines will have the same regulation as the first six installed, and in other respects the electrical constants will be the same. From the drawing in Fig. 3 the construction may be clearly seen. It is similar to the standard horizontal shaft engine driven alternators of well-known types, and its method of ventilation is the same. Recent improvements in mechanical construction of generators have made this type possible at the high speed of 250 revolutions per minute, and improvements in water wheel governors have made permissible the lower fly wheel effect incident to this design and the consequent omission of the nickel steel ring of the first machines.

In the two power houses, then, there will be three types of generator, but no trouble is expected in operating all the machines in parallel. As is well known, connection with the exciter plant in power house No. 1. The double set of bus bars permits of the separation of exciting circuits and lights and motors. The exciter compartment will be directly connected by telephone with the main generator switchboard.

Main Switchboard.

As in all plants, the most important element for successful operation is the layout of the switchboard apparatus. The switchboard in power house No. 2 has been carefully considered, and is believed to be convenient and as simple as it can be made and still accomplish the desired results. There has been a tendency in the design of some of the recent large switchboards toward complexity and the installation of unessential appliances, which by their presence cause more trouble and confusion *per se* than they are intended to prevent. This has been avoided as far as possible in the design of this board.

Fig. 5 shows a plan of the power house floor and the relative positions of generators, switchboard gallery, oil

switches and cable subway. Fig. 5 also shows a front elevation of the main switchboard gallery and controlling panels. The power house is divided in respect to switching into two parts, one of six generators and one of five. Each part has its own group of oil switches and its double set of bus bars. All the switches in the new power house are the General Electric electrically operated oil break type of the well-known design. This switch is shown in Fig. 6. All cables are led through the cable subway. They are heavily insulated with rubber, covered with a fire proof braid and supported on brackets with porcelain clamp insulators.

The main switchboard consists of a gallery in the center of the building, having mounted on it 36 separate controlling panels—11 generator, 22 feeder, 2 interconnecting and 1 exciter panel. The relative location of these panels can be seen in Fig. 5, together with their equipment. All the switching is done on these panels by means of relay switches placed in distinctive relation to one another and in such a relation to imitation bus bars placed throughout the face of the switchboard that the connections are clearly indicated and no mistake in switching can easily be made. On the generator panels are two selector relay switches and one generator relay switch; on the feeder panels are two relay selector switches, and on the interconnecting panels are relay interconnecting switches for making the various connections between the two groups in the new power house and between the two power houses. On the subbases of the generator panels are dummy exciter bus bars, with relay double throw generator field switches. All these relay switches operate electrically the real switches out on the power house floor, and have the exact relation to the dummy bus bars which the real switches have to the real bus bars, so that even a green man could hardly make a mistake in throwing a switch. Return indicators are placed adjacent to the relay switches, so that the operator may tell at once whether the real switch has responded correctly to the movement of the relay.

There has been a considerable craze during the last few years for the operation of switchboard apparatus by bench board control, but in designing the board for this plant the bench board system, although carefully considered, was rejected as inconvenient. In the bench board system the operator in switching must first go to the bench board and pick out the relay switch in question, then, taking his eye off the switch, he must pick out from a concentrated mass of instruments in front of him on entirely separate panels the instruments involved in the movement which he is about to make. This is not altogether convenient, and there is always a chance of a mistake. It is believed that the advantages of this bench board system are more imaginary than real.

In the switchboard installed in this plant each panel is a complete unit and comprises all the apparatus, both switches and instruments, which are necessary for any operation which may be made upon it. Thus, when the operator goes to a feeder or a generator panel he has before him, inclosed within the limits of the particular panel, all the apparatus with which he is concerned at the time. All synchronizing will be done by means of a Lincoln synchronizer placed upon a swivel on the top of the switchboard.

The generator field rheostats and field switches are located under the main switchboard gallery. All feeders are equipped with recording wattmeters installed in the basement of the new office building, through which the outgoing feeders pass at the end of the cable subway.

It is the intention to operate the 21 generators normally in four independent groups, but the interconnections are so arranged that they may all be operated in parallel if desired, or any one generator may be thrown on any group.

The feeder circuit breakers will be operated by time limit relays having an attachment devised by W. K. Gibboney of the power company. A time limit relay is a useful device for preventing a circuit breaker from opening unnecessarily at times of momentary overloads, but if a real short circuit occurs it is objectionable. Experience has shown that on a system like that at Niagara, where there is a large amount of synchronous apparatus in operation, if a short circuit occurs it must be disconnected at once, or else the prolonged drop in voltage will cause all of the synchronous apparatus to drop out of step; whereas, if the short circuit can be disconnected instantly the inertia of the rotating parts of the synchronous apparatus will keep them in step for this short period. For this reason the ordinary time limit relay is objectionable, since it causes a delay. The device referred to above consists of a dash pot attachment to the tripping plunger of the circuit breaker. This retards the movement of the plunger and consequently the opening of the breaker for ordinary temporary overloads, but if a real short circuit occurs the pull on the plunger is so strong that the dash pot has no effect and the circuit breaker opens instantly.

Canadian Plant.

Anticipating still further increase in the use of Niagara power, the Niagara Falls Power Company have, through their allied company, the Canadian Niagara Power Company, started work on their plant on the Canadian side of the Falls. This plant will be located in the Victoria Park, about 1500 feet above the Horseshoe Falls. Its hydraulic feature will be similar to the American plants, with its intake canal, wheel pit and discharge tunnel leading to the foot of the Horseshoe Falls. This power development will be used for the transmission of power to Toronto and other Canadian cities within transmission distance, and for the distribution of power to factories located in Canada in the neighborhood of the power house. It will also be used for the supply of power to the American power system, with which it will be arranged to operate in parallel.

The essential difference embodied in this plant will be in the size of unit and in the electrical arrangements. The unit will be of 10,000 horse-power capacity (7500 kw.), and the generators will be wound for 12,000 volts three-phase. The frequency will be retained at 25 cycles for the sake of uniformity with the American plants, so as to permit of parallel operation. In selecting this size of unit the American and Canadian systems were regarded as one. Since this is likely to reach ultimately an output of several hundred thousand horse power, a unit of 10,000 horse-power is not a large proportion of the whole, and is not too large an amount of power to concentrate in one machine from the standpoint of convenience.

The principal advantage in a unit of this size over the smaller one is in the reduction in cost of development per horse-power. This reduction in cost results from:

1. Lower cost of generator per horse-power.
2. Lower cost of turbines per horse-power.
3. A 10,000 horse-power unit occupies only slightly more space than one of 5000 horse-power capacity, which results, for a given plant output, in great reduction in length of wheel pit, power house and forebay and a consequent reduction in construction.

Other advantages will result, such as simplicity of operation, owing to the reduction in the number of units and reduction in the cost of maintenance. This size of unit was suggested by the engineers of the Niagara Falls Power Company, and was adopted upon their recommendation. The generators, three of which have been ordered, are being constructed by the General Electric Company.

This generator is shown in assembly in Fig. 7. It is of the internal revolving field vertical shaft type. Its revolving field ring is built up of punched laminations, bolted together, with joints lapped. This method of construction gives a uniform and definite strength of ring and high magnetic permeability. On account of the high speed, 250 revolutions per minute, the generator is very small as compared with some of the large engine driven units, its over all diameter being only about 19 feet. The weight of the revolving part of the machine is 141,000 pounds, with a fly wheel effect at 250 revolutions per minute of 2,000,000,000.

The generators are wound directly for 12,000 volts three-phase, instead of 2300 volts two-phase, as in the American plants. This high voltage was selected, not for long distance transmission, but for economy in distribution to power users near the power house. In dis-

tributing large amounts of power underground from a 2300-volt two-phase plant, after a radius of about 1 mile is exceeded, it becomes cheaper to transform to 12,000 volts three-phase and distribute at this voltage than to supply power directly at 2300 volts. From this it becomes evident that great economy results from the direct generation of the higher voltage. For long distance transmission, step up transformers will be used to raise the voltage to 22,000, 40,000 or 60,000 volts.

Fig. 8 shows the method which will be adopted for operating in parallel the American and Canadian systems. The connection will be made by triple conductor cables carried across the upper arch bridge over the Niagara Gorge. The paralleling will be done through step down Scott connected transformers, as shown.

The switchboard and auxiliaries have not yet been decided upon for this power house. It is not expected that it will be in operation for a year or 18 months.

Toronto Line.

In the discussion it was brought out that the Toronto transmission line will be operated at 40,000 or 60,000 volts. Each transformer would be wound with five coils, two in the primary and five in the secondary, each coil to carry a pressure of 11,000 volts. With different connections of these coils various secondary pressures could be obtained, as 22,000, 33,000, 38,000 and 57,000 volts. The insulators to be used will be of novel construction. The general form is cylindrical, with a horizontal axis. The cylindrical surface has four circumferential grooves and five ridges. One wire would be laid in each groove, and fastened by a tie wire wound in the groove. The insulator is supported on a yoke by means of pins projecting into the ends of the central opening. This construction of insulator is thought to secure highest insulation and to do away with all trouble from drip. The insulators are to be made in various sizes, from 8 to 14 inches long.

Sault Power Plants.

SAULT STE. MARIE, MICH., July 28, 1902.—The great water power canal of the Michigan Lake Superior Power Company, one of the Clergue industries, is about ready for water and will be filled some time in August. Water will be let in to test the works before the solid dam at the head of the canal is taken out. If, on testing, the canal is found perfect the dam will be dredged away and water turned on through the wheels. This canal has been described. Briefly, it is 20 feet deep, 200 feet wide, 1½ miles long, and discharges through 80 500 horse-power turbines, which are situated in a steel and stone power house 1400 feet long, built across the forebay and facing the Sault River below the rapids. Just below the power house the Union Carbide Company are now building a large factory, to be operated by power from the wheels. The Clergue Company have recently bought about 3000 acres of land near the canal, to be occupied by industries present and prospective. Among these will be large metallurgical works, the exact nature of which the company have not yet divulged, but which will treat minerals of the region. It is also probable that flour will be manufactured in considerable quantity from wheat grown in the Dakotas and Minnesota and in Manitoba.

As soon as this canal is completed and in operation work commences upon the third canal of the company, to be located on the Canadian side of the river and a short distance in the rear of the No. 1 canal, now working on pulp grinding and minor industries. An immense paper mill, for the finer grades as well as for print, will be built soon. It is also probable that outside interests will build a $4,000,000 mill to take power from one of the Clergue canals. It has been reported that a dry dock would be built at the Sault by this concern, but this is denied officially to the writer.

Under the stimulus of these works the Canadian Sault Ste. Marie has grown since midsummer of 1900 from a village of 1600 people to one of 13,000. It is yet little more than a village, the growth having been too fast for city comforts and conveniences to keep pace. The controlling interest there, however, is now to build street railway lines on both sides the river and is to connect them by powerful ice breaking steamers that will maintain the channels all the year. Full modern equipment has been ordered. Numerous plans for other metropolitan conveniences are in consideration.

A large fleet of chartered ships has been carrying Clergue ore from the Helen mine to lower lake ports all summer. These ships were chartered with the privilege of purchase by the Algoma Central Railway Company, the Clergue transportation interest, and it is stated that the option privilege will be exercised this fall. The same interest this week launched the "Agawa," a steel schooner of 400 feet and 5500 tons capacity, and will probably follow it by others of the same class. The ship was the largest ever built in Canada and was put up by the Collingwood Shipbuilding Company.

At the Helen iron mine the company have been changing methods of mining from surface to underground and will have the first underground level in operation in a few months. The ore found in this level is assaying surprisingly well, being much higher in iron and somewhat lower in phosphorus than that above ground. The mine will not be as heavy a shipper as it was early this year until this underground work is forwarded. A shaft is being sunk at the Josephine iron mine. The several nickel mines in the Sudbury region are progressing well.

The Algoma Central & Hudson Bay Railway will be graded to these iron mines this fall, but it will be some time later before bridges are built and the rails laid. Probably not much through traffic can be carried on before next spring. A glance at a map on which are laid down this road and the same company's Manitoulin & North Shore, as well as the Canadian Northern and the Government lines of Canada, is most suggestive of a future transcontinental road, and it would not be at all surprising if this Algoma line should be at the west end of Lake Superior, in Canada, long before it reaches Hudson Bay. The Manitoulin & North Shore will form a direct connection between the Sault and the West and the independent lines now reaching the Atlantic and Quebec.

D. E. W.

Calumet and Hecla Earnings.

The annual report of the Calumet & Hecla Mining Company for the year ended April 30 has been issued. The production of copper compares as follows with previous years:

	1901-2.	1900-1.	1899-1900.	1898-9.
Tons refined copper	39,982	36,326	49,312	44,450

The balance sheet for four years ended April 30 is as follows:

	1902.	1901.	1900.	1899.
Cash and copper	$3,950,575	$3,487,855	$5,902,859	$5,335,079
Notes, bills receiv.	366,658	382,011	573,576	801,238
Insurance fund	149,936	.....	504,583	353,647
Totals	$4,467,171	$3,869,868	$6,981,019	$6,489,964
Liabilities.				
Drafts and bills payable	$502,816	$760,899	$495,160	$446,420
Machinery contracts	371,575	640,838	1,425,000	645,000
Set aside	.....	300,000	800,000	1,000,000
Totals	$874,391	$1,701,737	$2,720,160	$2,091,420
Balance	$3,592,779	$2,168,130	$4,260,858	$4,398,544

President Agassiz says: "During the past year we produced mineral equal to 42,462 tons of refined copper, as against 37,932 tons last year (this small production was due to the fire at the mine of that year). Our product in refined copper was 39,982 tons. For the previous year our product in refined copper was 36,326 tons. The price of copper has varied from 16⅝ to 11 cents per pound and is now about 12½ cents. There have been paid during the past fiscal year one dividend of $15 and two of $10 each. We have continued to push the openings on the conglomerate belt in the vicinity of the Red Jacket shaft. I regret to state, as noted in previous reports, that the character of the lode has not improved in depth. The machinery destined to operate the Osceola amygdaloid lode is slowly being delivered. Meanwhile it has been deemed best to discontinue under-

ground work upon this lode. During no year, perhaps, in the history of the mine has so large an equipment been added by the company as during the past year."

The directors met July 29 and declared a dividend of 5 per cent. This is the same rate as that declared in May, when the dividend was lowered to a basis of 20 per cent. a year from 40 per cent.

Notes from Great Britain

American Purchases in Great Britain.

LONDON, July 19, 1902.—There is now either a distinct slackening in the American demand for raw material so far as the British market is concerned or the trade is becoming too regularized for official notice. There are still some inquiries for German steel billets, and some purchases have been effected in structural steel. But, taking a broad view of American purchasing activity on this side of the Atlantic, it seems as if the demand is slackening. It may therefore be well to state as accurately as possible the extent of these purchases. I will endeavor to set out first of all the extent of iron and steel shipments to the United States for the complete half year, and secondly to give fuller particulars of shipments during the past three months. By this method a little calculation will show which quarter was the most active, while the more detailed statement of the ports exporting minerals will indicate clearly the trade currents. After presenting the statistical matter, I will make one or two comments on the question of prices. I regret that I cannot supplement my information with German statistics, but these are not yet available.

During the first six months of 1902 Great Britain exported to the United States 81,903 tons of pig iron, compared with 20,101 tons in the first half of 1901 and 31,041 tons in the year 1900. In these shipments are included foundry pig iron, Bessemer pig iron, ferromanganese and spiegeleisen. During the same period British exports of rails reached 5198 tons, of which no less than 5167 tons were exported in the month of June. British shipments of cast and wrought iron and cognate manufactures to America showed a slight increase on previous half years, but amounted in all to only 1627 tons. Another item showing a big bound upward is that of old iron and steel for remanufacture, rising from the merely nominal figure of 101 tons during the first half of 1901 to no less than 4185 tons up to the end of June this year. Unwrought steel during the same period rose to 20,209 tons, compared with 5132 tons during the same six months of 1901. Coming now to the last three months, ended June 30, 1902, I have compiled a special list showing not only the fullest extent of the tonnage of iron and steel bought by the United States during the past quarter, but also their estimated cost on the f.o.b. values according to the exporters' own specifications, as follows:

	Tons.	£
Old iron: London	847	3,374
Liverpool	652	1,935
Manchester	904	2,705
Glasgow	1,031	4,079
Bristol	391	1,064
	3,825	13,157
Pig iron: Liverpool	22,188	117,191
Hull	1,920	10,559
Manchester	300	773
Glasgow	9,565	30,791
Fleetwood	550	1,729
Grimsby	700	1,920
South Shields	3,450	9,911
Swansea	311	2,866
Leith	2,400	6,812
Middlesbro	15,382	43,174
Granton	450	1,482
	57,216	227,208
Bars: Liverpool	1,137	18,424
Leith	106	578
	1,243	19,002
Rails: Liverpool	137	865
Barrow	3,061	14,793
Middlesbro	2,000	11,272
	5,198	26,930
Wire, except telegraph: London	15	227
Liverpool	805	18,182
Hull	279	3,152
Glasgow	137	2,363
Ardrossan	1	57
	1,237	23,981
Hoops: Liverpool	627	4,552
Hull	52	388
	679	4,940
Sheets and boiler plates: Liverpool	14	213
Galvanized sheets: Liverpool	277	3,130
Tin plates: Liverpool	5,164	71,110
Bristol	1,773	26,376
Swansea	10,134	122,633
	17,071	220,119
Cast and wrought iron, unenumerated:		
London	28	145
Liverpool	296	7,849
Southampton	9	341
Glasgow	341	5,811
Swansea	6	132
Ardrossan	129	652
	809	14,930
Steel, unwrought: Liverpool	3,329	97,241
Hull	771	7,631
Glasgow	10,055	53,903
Leith	462	2,812
Ardrossan	961	5,447
	15,578	167,034
Black plates for tinning: Swansea	37	450
Manufactured iron and steel, unenumerated:		
London	2	214
Liverpool	37	17,774
Southampton	4	1,804
Glasgow	4	78
	47	19,870

Prices.

The most interesting feature of the foregoing statistics is that of pig iron. I have already pointed out that under this heading are included Bessemer, ferromanganese and spiegeleisen. It may be assumed that the bulk of the shipments, ex-Swansea, 311 tons, was spiegeleisen. The shipments from Liverpool, while in bulk doubtless ordinary pig, also included considerable quantities of ferromanganese and Bessemer, while the shipment from Fleetwood would, in all probability, be Bessemer. The shipments from Glasgow were miscellaneous, but mainly ordinary pig iron. It may be taken for granted, from numerous inquiries I have made, that the prices obtained in this country have, in all cases, been very near to ordinary market prices. The purchases of Cleveland No. 3 would lie mainly between 49 and 51 shillings. The purchases of Bessemer have centered 'round 60 shillings, f.o.b., mixed numbers. The same remarks apply to the purchase of steel in billets or slabs. The English market has been steady, and American buyers have gained nothing even for fair sized shipments. If anything, they have been paying from 1 to 2 shillings 6 pence over market rates. There has been some cross buying of ferromanganese. Some German ferromanganese has been shipped, but not much, as the English prices and quality have better suited American needs. One large firm interested in this line of business informed me that they could have sold more German ferromanganese had prices proved more remunerative.

It is when we come to American purchases from Germany that the really serious fluctuations in prices have taken place. The habitual reticence of German selling agents in London has had considerable effect in making prices very uncertain, while in the earlier part of the year forced German sales led to some slaughtering. One curious result is worth noting for the future guidance of American buyers, and I can say it without hesitation, being fortified in my statement by the expressed opinions of two prominent London buyers. Wherever American manufacturers have gone direct to German sellers they have almost invariably bought at a price much higher than if they had bought through London houses. One German seller told a friend of mine point-blank that his price for a certain line of steel billets was so much, but if the parcel was for America then his price was 5 shillings extra. On being told that the

remark was a foolish one, he said that he had on several occasions obtained the higher price from the less experienced American buyers, and that he did not want the market spoiled. London buyers for American houses tell me that the curious reticence of German houses has not helped trade. An inquiry of a German seller may lead to the reply that they are full and cannot undertake any further business, but experience has shown that a prompt, firm offer has led to acceptance without more ado.

On the average, steel billets and bars, Siemens quality, bought from Germany average 10 shillings less than those bought in Great Britain. Freight rates from Germany may be set down at 7 shillings 6 pence to New York, 8 shillings to Boston, 10 shillings to Philadelphia and 7 shillings 6 pence to Baltimore. Pig iron freights have been at the rate of 6 shillings 6 pence to 7 shillings. My remarks referring to German steel billets and slabs will not apply to the American purchases of structural material. German structural material sold to America has been sold close and, in the main, under rather than over market prices. A quotation shown to me on July 9 for steel billets, c.i.f. Philadelphia, was at 92 to 95 shillings, with 2 shillings more for sheet bars, while blooms were selling at 90 to 92 shillings 6 pence. While London buyers, who chiefly concern themselves with the European trade, recognize a distinct slackening in the demand for steel billets and slabs, orders from Americans for Scotch pig come merrily in. A fortnight ago a contract for 4000 tons of Carnbroe was signed, and it is authoritatively stated that a line of Cleveland pig has been sold to the same buyer.

Scotch makers are short of stock, on account of these large sales, and for new contracts the price is stiffening by 6 pence to 1 shilling per ton. The Steel Company of Scotland are reported to have contracted for the delivery of a large quantity of steel angles and channels to America, but there is little or no American demand for steel plates. The immediate difficulty is transportation, and rates are stiffening. Another contract recently concluded is that of 5000 tons of West Cumberland Bessemer, while the same buyer is negotiating business in semifinished and finished steel, and is stated to have so far succeeded in securing 3000 tons of steel billets from a West of Scotland maker. In the Midlands English pig iron producers are relining 13 furnaces and rebuilding 41. The total number of furnaces blowing in Derbyshire, Leicestershire, Lincolnshire, Northamptonshire, Shropshire, North Staffordshire and South Staffordshire is 101, which represents 60 per cent. of the number possible.

American Competition on the Brain.

The measure of the fear that many British manufacturers have of American competition can be seen from the strenuous efforts to counter American competitors with something special in the way of an improved patent, or by calling for tests of greater severity. For instance, some well-known press and die makers, when putting in specifications for new machinery, attach the following notice, which American engineers will read with interest:

Notice.—American Competition! It having come before our notice that agents of certain American firms have represented their power presses to be more up to date than those of our make, we beg to state that as a proof that this is not the case, we will gladly send any standard size adjustable power press (this being the type of press by far the most in use) on approval to any intending purchaser to be placed alongside any American make (or any other make in the world), and if we cannot prove our power press to be absolutely superior in quality and finish and more up to date, we will take same back free of any cost whatever to our client, and the American-made machine can be retained. As a practical proof of the superiority of our machines we might say that a commission representing an important Continental house connected with a foreign Government (address and subsequent unsolicited testimonial furnished on application), after inspecting American, British and German designs, placed their order for 75 improved adjustable power presses in our hands. We can warrant our improved power presses to be the most up to date in the world, and the only ones to carry a satisfactory safety clutch (patented in Great Britain and America), and any intending purchaser would do well to come and see all sizes in motion at our works, or to avail himself of the offer we make above.

A Big Through Rate.

A London correspondent, whose authority is good, states that he has heard from St. Petersburg that an official of the Russian Ministry of Ways and Communications is leaving there next week for the United States for the purpose of, if possible, coming to an arrangement with various American railways for a through passenger and traffic rate from Russia, Siberia and Manchuria to the United States. It is said that the Russian authorities are prepared to offer such low terms that a general agreement is certain to be arrived at. If this statement is true, it means a new departure of great significance.

Assisting Workmen to Become Shareholders.

Sir Christopher Furness is generally fruitful of interesting surprises, and his latest is an attempt to bring in workmen as shareholders in the well-known concern of Furness, Withy & Co., ship owners and shipbuilders, of West Hartlepool. The company have been exceedingly successful under present auspices. They are now issuing 500,000 new ordinary shares of £1 each, offered for public subscription at a premium of 10 shillings per share. Sir Christopher, in his speech at the annual meeting of the company in announcing the issue of new stock, said that in this connection he was desirous of giving all those who were associated with him in the work of the many industrial concerns over which he presided an opportunity, if they so wished, to become shareholders in this his original company, thus enabling them to have a direct interest in the financial results of their labors. Officials and workmen would generally realize that by assiduous attention to their own particular department they would contribute not only to their own prosperity, but indirectly to the prosperity of the nation at large, and he thought it was only when the workers fully realized the importance of their individual work and the folly of neglecting it for the passing and often dangerous excitement of the moment that they could hope to hold their own with other nations who were determined to occupy our place in the industrial world. He was, therefore, in his personal capacity arranging to give special facilities to the many thousands who were connected with him in the work of his various undertakings and who, while desiring to apply for some of these ordinary shares, might feel that they were not momentarily prepared for such an outlay. He was ready to advance to them, at the rate of 3½ per cent. per annum, the amount they required to enable them to become shareholders. Accounts would be opened crediting them with the dividends, which it was proposed to pay quarterly at the rate of 10 per cent. per annum, and which would yield, even though no bonus were declared, a very good interest on the issue price. It would be interesting to know what has been the response on the part of the workmen to this very fair business proposition.

The Future of the Heavy Motor Car.

There can be no shadow of doubt that the motor car or truck has a big future. A few days ago, in connection with the International Congress on Tramways and Light Railways, about two dozen motor vehicles were paraded on the London Embankment, carrying loads up to 5 tons, while two had pantechnicon vans for furniture removal. An interesting feature was the prevalence of steam motors. Quite three-quarters of the vehicles had steam boilers mounted in front with the steam engine underneath, and were mostly of the Thorneycroft type, which has done good service in South Africa during the war. Several of the boilers were fired with coal or coke instead of having oil spraying burners. These motor cars, all British built, ranged in tare about 3 tons, and were from 18 to 20 horse-power. In this connection it may be mentioned that the Austro-Hungarian Ministers of Commerce and Agriculture are taking a step which may lead to a very large demand for motor conveyances. They are considering an entirely new form of motor, driven both by petroleum and electricity, guaranteeing the maximum of power with the minimum of weight. This motor is now under con-

struction, and when ready it will be tested with the view of organizing a steady service for agricultural purposes.

The Armor Plate Orders for Sheffield.

The three Sheffield firms producing armor have now received from the Admiralty full details of the armor required for the new battle ships. The armor for the "Dominion" goes to Vickers, Sons & Maxim; for the "King Edward VII" to John Brown & Co., and for the "Commonwealth" to Charles Cammell & Co. The weight in each instance is about 3000 tons. Delivery is to be completed early next year.

An Armor Plate Mill for Japan.

Davy Brothers of the Park Works, Sheffield, have just received an order from the Imperial Japanese Government for an armor plate mill complete. It will be similar in almost all respects to the one the firm supplied recently to the order of Armstrong, Whitworth & Co. of Manchester. The plant comprises a 48-inch armor plate mill, with a three-cylinder reversing engine developing 12,000 horse-power. A mill of this power, besides being suitable for armor plate work, can also with advantage be used for rolling plates of such thickness as are required for boilers, girders and ship work. Davy Brothers have also on hand a 120-ton tilting furnace for the production of steel, and in their boiler department they are very busy. The orders include several installations of boilers for electrical stations. They are of the Lancashire type, and are fitted with the Ellis and Eaves system of induced draft for preventing smoke and promoting economy in the consumption of fuel.

Going to Dusseldorf.

The members of the Iron and Steel Institute who will attend the autumn meeting, to be held this year at Dusseldorf, are to have a very cordial welcome from the civic authorities of the Rhenish city. The provisional programme of the meeting includes a conversazione and concert given by the Mayor and corporation of Dusseldorf, visits to the very successful exhibition, where groups will be formed under the guidance of English speaking experts for the purpose of examining the various sections of mining, metallurgy and machinery, and to places of interest in the vicinity. Arrangements have also been made for the members of the institute to visit in groups the Krupp establishment at Essen, the Dortmund Works, the Phœnix Works at Ruhrort and the Vulcan Works at Duisburg, and an excursion is planned to the picturesque district of Vohwinkel, to the Elberfeld suspended railway and to the Kaiserbridge, near Mungsten. S. G. H.

Aids to Lake Commerce.

SAULT STE. MARIE, MICH., July 27, 1902.—General Gillespie, chief of the corps of engineers, U. S. A., called a meeting of a board of engineers that sat at Sault Ste. Marie last week. Their object was to consider the best way of caring for the increasing traffic of Lake Superior through the Government canals and locks. The traffic will this year reach 30,000,000 tons, all to be moved in 220 days, and if the present rate of growth is maintained, will be 35,000,000 tons in two years.

It had been proposed that the Weitzel lock, built in 1881, should be enlarged to fit modern requirements. But so far as a matter of this kind can be settled before final action by the department it is now agreed that this will not be done. It was the opinion of the board, and will be their recommendation, that a third canal be built, to be 1500 feet long between gates and 60 feet wide. This will be larger than the Poe lock and will accommodate three of the largest lake ships at one time. This canal will be built between the Poe lock and the rapids and in space now partially occupied by the rapids and partially by the tailrace of the Chandler-Dunbar Canal. In order to accommodate vessels above the general entrance to the three canals the latter will be widened to 500 feet, thus averting a danger that is now considerable every time the valves of the present canals are opened simultaneously. The new lock will be of concrete, instead of cut stone, as are both those now in use, with steel gates like those of the Poe lock, and its general plan of operation will be like that. Preliminary to its construction a great coffer dam must be built along the water side. The entire excavation, which will be to about 55 feet below Lake Superior level, will be in sandstone. D. E. W.

Beker's Statistical Charts.

We have received from R. G. Beker, Frick Building, Pittsburgh, Pa., copies of five charts which he has just issued, graphically showing the production of iron ore, coal and coke, pig iron, steel and steel products in the United States and other countries, according to latest official statistics. These charts are of a size sufficiently large for framing, and present an admirable method of comparing the output of the United States with other countries, as well as of observing the development of each of the trades covered during a long series of years. Mr. Beker has used a great deal of ingenuity in plotting the diagrams and excellent judgment in selecting and arranging his material.

The iron ore chart shows the production of iron ore in this country from 1891, the production of the different Lake Superior ranges from 1885, the output of the leading mines on each range for last year and information relative to shipments from the various ore shipping ports. The chart relating to coal and coke presents a comparison of the production of coal in the leading coal producing countries of the world; also a comparison of the coal production in the various States of this country, together with a plotted diagram giving the production of coal and coke in this country from 1880 to the present time. The pig iron chart covers the production of the United States from 1820 down to the present time, and makes a comparison of the production in this country with that of Great Britain and Germany since 1880. The chart also graphically makes a comparison of the production by all the leading countries for the latest years available, as well as the production of this country by States and the furnace capacity of the leading American producers. The steel chart gives a presentation of the world's production of steel billets, not only giving the total production, but also making a comparison between Bessemer and open hearth steel, covering the period from 1885 down to the present time. The chart showing steel products covers the world's production of rails, and gives the American production since 1885 of plates and sheets, wire rods, structural steel, tin plate, wire nails and cut nails. Copies of these charts can be had from Mr. Beker for $1.25 each.

A South American Iron Ore Scheme.—Boston dispatches state that F. S. Pearson, a director of the Dominion Iron & Steel Company, and who has been largely identified with Henry M. Whitney in the Dominion Coal and Dominion Iron & Steel enterprises, has formed a $10,000,000 company to acquire large ore deposits on the Orinoco River, Venezuela. The company will have $3,000,000 preferred and $7,000,000 common stock. They have secured title to the Venezuela properties which are estimated to have in sight 100,000,000 tons of high grade iron ore above the water level. The company have entered into a contract with the Dominion Iron & Steel Company for about 300,000 tons of iron ore per annum at a cost substantially $1 per ton lower than the ore will be sold to other consumers. It is the purpose of the new company to build a large fleet of steamers of 8000 tons capacity each to transport the ore to market.

Being interested in a shovel handle factory at Evansville, Ind., the Vandergrift Coupling Company are removing their coupling business to that city, that they may be enabled to have personal supervision over both lines.

Albert Ladd Colby, metallurgical engineer of the Bethlehem Steel Company, sailed for Europe on July 29 on business for the company.

The Iron Age

New York, Thursday, July 31, 1902.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
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The Business Outlook.

At the end of July the summer has so far advanced that the outcome of the crops can be conjectured with a reasonable degree of certainty. The winter wheat harvest is over, the oats harvest is progressing and the spring wheat, corn, cotton and other fall crops are so far along that little can happen after this time to injure them seriously. It is, therefore, fairly safe to begin to take an account of stock and see how the country stands with regard to its agricultural interests, which are the foundation of all prosperity. It is now the belief of those who should be well informed on these subjects that the United States will this year enjoy a heavy crop of wheat, running well above the average; a bountiful yield of oats, comparing favorably with past good seasons; a "bumper" crop of corn, which may far surpass anything before experienced; a large production of cotton, perhaps above the average, and a sufficient yield of other agricultural products to rejoice the hearts of those who make a specialty of them. The drought in the Southwest early in the year and the excessive rains in numerous sections through the spring and summer wrought injury in some localities and caused heavy losses, especially in the flooded areas, but the general condition of the country was so very favorable for growing crops that the grand result up to this time has not been seriously affected.

The basis for another year's good business thus seems to be established. The railroads which serve the agricultural sections are already counting on a heavy fall and winter traffic and are making their preparations accordingly. The managers of these lines as well as of those not directly dependent on farming interests are no longer cautious in their prognostications of the future, but speak in the most sanguine terms of the great volume of business which they expect to handle. They are embarking in schemes for the betterment of their facilities with confidence in their ability to earn the money to pay for them. This confidence has been stimulated by the remarkable ease with which the country endured the heavy reduction in last year's fall crops. Although the loss was so great that for a time a serious backset to business was apprehended, yet the momentum of the previous prosperous years was sufficient not only to carry us safely over to another crop season, but even to swell the demand for manufactured products to unprecedented proportions. This is strikingly shown in the statistics just published by the American Iron and Steel Association, which give the marvelous total of 17,012,315 gross tons of pig iron produced in this country in the 12 months extending from July 1, 1901, to July 1, 1902, which was much in excess of any previous 12 months, although covering the precise period of crop failure and loss of trade on that account. Not only was this vast production required by the wants of the country, as shown by the stocks of less than 30,000 tons in makers' hands unsold on July 1, but a considerable quantity was imported besides. In other branches of the iron and steel trades and in other lines of productive industry similar results are shown. Surely, after such an experience the managers of railroad interests are warranted in entertaining bright hopes for the future when the country is blessed by superabundant crops.

But is a continuance of the heavy demand for manufactured products to be expected? Has not the country supplied its wants to such an extent that a decline in trade should soon be experienced? Will bountiful crops insure the prosperity of manufacturing interests indefinitely? These are questions which present themselves to every manufacturer and merchant, when he gets time to reflect upon the situation. If conditions were in any way analogous to those of any past period in the experience of the country, these questions could be answered very easily. The answer would be that the demand was not likely to last long, that the country was getting well stocked with merchandise and that big crops by no means always assured big business. But conditions have greatly changed in the past five years, and the experience of former times is not an infallible guide. Those who relied on their judgment as acquired by that experience, and have been looking for a collapse in prices since the culmination of the boom of 1900, have paid dearly for their lack of faith in the stability of the market. The great growth of the country in population, the wonderful prosperity of Western farmers, the huge foreign demand for all classes of American products, the comparatively light imports for a long series of years, the advance of the United States to a commanding position in the world of finance, the organization of colossal industrial corporations—all these and more have had their effect in increasing the business of this country and expanding it to dimensions beyond the expectation of the wildest dreamer. As far as can now be observed, no unfavorable indications appear. The coal miners' strikes in Pennsylvania and the Virginias cannot last much longer, and when they are settled the effect on general business will be decidedly beneficial. Conservative business men look with some apprehension on the pyrotechnical display in Wall Street, but even that can be read as one of the manifestations of faith in the future, as Wall Street is quite a reliable barometer as to business prospects. With all external conditions favorable, the future of the iron trade appears to depend largely upon itself, being a question of supply and demand. Productive capacity, therefore, should not grow too rapidly.

Tubular Boilers in the English Navy.

A voluminous report has been made by the committee appointed by the Lords Commissioners of the Admiralty of Great Britain to consider certain questions respecting modern types of boilers for naval purposes. The instructions were to ascertain practically and experimentally the relative advantages and disadvantages of the Belleville boiler for naval purposes, as compared with the cylindrical. Although the principal feature of the report concerns the Belleville boiler, all of the best known water tube boilers were examined by the committee. From the evidence it appears "that no type of water tube boiler at present in use is, on general service, as economical as the cylindrical boiler." This is one of those general statements which will bear considerable discussion and which will not be received as final, even from a committee of this character.

The first disadvantage of the Belleville boiler is that "the circulation of the water is defective and uncertain," due probably to the long tubes and abrupt curves, as compared with other types. Other defects are: The

automatic feeding device is complicated and delicate; an excessive pressure, above that used by the engine, is required by the feed pumps; different rates of combustion influence the quantity of water in the boiler; the upper tubes are liable to fail by corrosion or pitting. These are the main faults.

The advantages possessed by water tube boilers in general, as compared with cylindrical, are enumerated as follows: Less delay in raising steam; less liability to damage if the boiler be struck by a projectile; greater ease of repair and renewal of parts; less weight for the power generated, considering the weight of the boiler installation only; ability to carry a higher steam pressure; greater fire grate area for the same floor area, with consequent less forcing for full power. While it is acknowledged that most of these qualities are possessed by the Belleville boiler, they are, in the opinion of the committee, more than counterbalanced by the disadvantages.

We now reach what we think is the most interesting part of the report, as it will probably govern the action of the English navy in the future boiler equipment of war vessels. We quote:

> Until a thoroughly satisfactory type of water tube boiler is obtained, the committee therefore recommends that in large cruisers and battle ships cylindrical boilers of sufficient power to work the auxiliary machinery and to drive the ship at her ordinary cruising speed should be fitted; the steam pressure should be the same for the water tube and cylindrical boilers, and may conveniently be 210 pounds per square inch, so as to give 200 pounds at the engines. By this means considerable saving in coal will be effected, with a corresponding increase in the radius of action and general usefulness of the vessel. The water tube boilers could be kept clean and perfectly efficient, as they need only be used for driving the ship at high speeds, when economy of coal relatively is not so important. The cylindrical boilers should be fitted with retarders in the tubes, and with special means for circulating the water while raising steam.

Here is a composite arrangement of two widely different types of boilers, the simpler one to be used in every day service, the more complicated one to be used only on special occasions. While engineers continue to be trained in the engine room—a practice which now obtains to a large extent in the English navy—it is difficult to understand how this plan will provide the education which will be necessary in time of emergency. It is known that even the Belleville boiler, so heartily condemned by the report, has proved successful when in the hands of a competent crew thoroughly familiar with its operation. But it is considered expensive to educate engineers by placing them in charge of complicated and costly apparatus.

"Until a thoroughly satisfactory type of water tube boiler is obtained" the British naval officials will not countenance this type. The other navies of the world and the merchant marine may bear the brunt of the investigation and carry on all necesssary experiments. After this work has evolved the water tube boiler perfectly adapted to service on board ship Great Britain will adopt it, but in the meantime she prefers that some one else should bear the burden.

It is further stated, in confirmation of an opinion in a previous report, "that the advantages of water tube boilers for naval purposes are so great, chiefly from a military point of view, that, providing a satisfactory type of water tube boiler could be adopted, it would be more suitable for use in His Majestys Navy than the cylindrical type of boiler." This is a platitude applying with equal force to every appliance on a vessel. The satisfactory—in this case perfect—type will always be used to the exclusion of the inefficient and unsatisfactory. The water tube boiler is better than the cylindrical for war ships, but it must be improved.

The Use of Petroleum in Making Pig Iron.

Two Russian engineers, named Pitersky and Ivanoff, have devised a process by which petroleum can be utilized in the production of pig iron in connection with a certain quantity of solid fuel. In a paper read before the Baku Technical Society the following description of the process was given:

The solid fuel is placed in a special generator, into the lower part of which are introduced the heated gases from the combustion of petroleum. The fuel charged from above gradually falls to the bottom and becomes heated; dry distillation results, and the gaseous products are drawn off from the upper part of the generator and utilized for fuel, while the resulting coke continues to descend. The products of combustion entering the lower part of the generator pass over the incandescent coke, are deoxidized, and are thus available as reducing agents, which can afterward be used in the second furnace. This furnace, which is used for producing iron, resembles an ordinary blast furnace, from which it merely differs in having a tube running down the center. The ore and fluxes are placed in the circular space between the walls of the furnace and the central tube, the latter being charged with a quantity of coal sufficient to supply the iron with the required equivalent of carbon for converting it into pig iron, also, if necessary, with fluxes for changing the composition of the slags. The circular space and the central tube are provided with covers to retain the gases. The heated reducing gases from furnace No. 1 are made to enter the lower part of furnace No. 2 through several openings. The gases at first melt the ore and slag. In ascending without changing their composition they convey their heat to the materials, and they then begin to act chemically, by reducing the iron oxides, absorbing their oxygen, and becoming converted into carbonic acid. Although the gaseous medium gradually acquires pronounced acid properties, the effect of the carbonic acid is counteracted by the fall in the temperature. The spent gases collecting in the upper part of the furnace are utilized as fuel, the reduction process being preferably carried out by means of carbonic oxide. The central tube terminates at the place where a temperature of 900 degrees C. prevails. The atmospheric medium at this horizon being of a reduced nature, the carbon dropping into the charge could only be utilized in combining with the iron to form pig iron. The pig iron and slags produced are tapped in the usual manner. The molten pig iron from furnace No. 2 is run into the Bessemer converter. The pig iron is converted into steel; the gases are led into generator No. 1 and serve for producing pig iron in furnace No. 2.

Germany Retains Its Iron Tariff.—A press cablegram from Berlin, dated July 29, says: The Government succeeded in getting the pig iron clauses of the tariff bill adopted by the Tariff Committee of the Reichstag to-day without amendment, but only after strenuous opposition and long debate. When the committee took up clauses 777 to 784 of the bill, amendments providing for the reduction and for the abolition of the duty on pig iron were offered. The Prussian Minister of Commerce, Herr Moeller, said he shared the views of the representatives of the iron industry, who considered the repeal of the iron duties at the end of the seventies to have been a serious mistake which had injured the whole fabric of German economic life. Count von Posadowsky-Wehner, the Imperial Secretary of State for the Interior, opposed a plea to prohibit importation based on alleged attempts of the American trust to unload its goods in Germany at ruinous prices. He declared that such prohibition would injure other German industries. In conclusion he said that without the protective tariff of 1879 the revival of German trade would have been impossible, and it would be a criminal mistake to abandon it now, while foreign countries were combining to form great protectionist unions.

Pig Iron Production for Six Months.

James M. Swank, general manager of the American Iron and Steel Association, publishes in the *Bulletin* for July 25 complete statistics of the production of all kinds of pig iron in the United States in the first half of 1902; also complete statistics of the stocks of pig iron which were on hand and for sale on June 30, 1902. It is gratifying to note the statement that every manufacturer of pig iron in the country, without a single exception, responded to the request for this information.

Total Production.—The total production of pig iron in first half of 1902 was 8,808,574 gross tons, against 7,674,613 tons in the first half of 1901 and 8,203,741 tons in the second half of 1901. The increase in production in the first half of 1902 over the second half of 1901 was 604,833 tons. The united production of the second half of 1901 and the first half of 1902 amounted to 17,012,315 tons. It is possible that the production of the whole year 1902, notwithstanding the interruption to furnace activity caused by the anthracite strike, may exceed 18,000,000 tons. The production of pig iron by the United States in the first half of 1902 was in round figures 1,000,000 tons greater than the production of either Great Britain or Germany in the whole year 1901, the total production of these countries in that year being respectively 7,761,830 and 7,736,663 gross tons.

The details of production by States for the last three half yearly periods are as follows:

	Blast furnaces.				Production.—Gross tons of 2,240 pounds. (Includes spiegeleisen.)		
	In blast	June 30, 1902.			First half of	Second half of	First half of
States.	Dec. 31, 1901.	In.	Out.	Total.	1901.	1901.	1902.
Massachusetts	1	...	3	3	1,952	1,434	1,716
Connecticut	2	2	2	4	4,621	3,821	5,278
New York	7	9	11	20	109,317	174,345	186,523
New Jersey	6	6	5	11	65,524	90,222	105,295
Pennsylvania	111	109	40	149	3,549,148	3,794,109	4,045,965
Maryland	4	4	2	6	157,628	145,558	148,619
Virginia	14	16	10	26	217,819	230,843	263,233
North Carolina	...	...	2	2	15,547	11,786	12,401
Georgia	1	2	3	5			
Alabama	29	31	16	47	627,214	597,998	700,546
Texas	...	...	4	4	1,320	953	1,528
West Virginia	3	3	...	3	74,630	91,967	93,297
Kentucky	4	6	2	8	26,361	42,101	51,089
Tennessee	12	15	7	22	178,244	158,895	187,359
Ohio	45	46	13	59	1,598,850	1,727,575	1,775,496
Illinois	15	19	1	20	739,409	857,441	879,800
Michigan	5	6	2	8	93,981	76,781	85,661
Wisconsin	2	6	...	6	124,273	83,278	131,531
Minnesota	...	...	1	1			
Missouri	1	2	...	2			
Colorado	3	3	...	3	88,775	114,634	133,237
Oregon	...	...	1	1			
Washington	1	1	...	1			
Totals	266	286	125	411	7,674,613	8,203,741	8,808,574

Classified Production.—The production of Bessemer pig iron in the first half of 1902 was 5,105,932 gross tons, against 4,582,187 tons in the first half of 1901 and 5,014,606 tons in the second half of 1901. The figures for 1902 include 81,818 tons of low phosphorus pig iron. In 1901 the production of low phosphorus pig iron was not separately ascertained, but is included with Bessemer pig iron.

The production of basic pig iron in the first half of 1902 was 1,053,274 gross tons, against 645,105 tons in the first half of 1901 and 803,745 tons in the second half of 1901.

The production of charcoal pig iron in the first half of 1902 was 186,098 gross tons, against 194,231 tons in the first half of 1901 and 165,916 tons in the second half of 1901. In addition there were produced in Tennessee in the first six months of this year 6004 tons of pig iron with mixed charcoal and coke.

The production of spiegeleisen and ferromanganese in the first half of 1902 was 118,982 gross tons, against 135,920 tons in the first half of 1901 and 155,541 tons in the second half of 1901.

Unsold Stocks.—The statistics of unsold stocks do not include pig iron sold and not removed from the furnace bank, or pig iron manufactured by rolling mill owners for their own use, or pig iron in the hands of consumers. The stocks which were unsold in the hands of manufacturers or their agents on June 30, 1902, amounted to 29,861 tons (of which only 3525 tons were charcoal), against 70,647 tons on December 31, 1901, and 372,560 tons on June 30, 1901. In addition to the 29,861 tons above mentioned the American Pig Iron Storage Warrant Company had in their yards on June 30, 1902, 1000 tons of pig iron, of which 800 tons were coke and 200 tons were charcoal pig iron. The manufacturers had parted with the control of this 1000 tons. The association never before recorded such small stocks of unsold pig iron as the figures for June 30 represent. The details are as follows:

	Gross tons of 2,240 pounds.			
	Dec. 31,	June 30,	Dec. 31,	June 30,
States.	1900.	1901.	1901.	1902.
Massachusetts and Conn.	2,791	1,477	684	463
New York	34,260	14,930	4,907	772
New Jersey	11,500	3,150	648	241
Pennsylvania	134,995	138,921	20,750	9,279
Maryland	24,513	21,134	8,477	5,267
Virginia				
N. Carolina, Ga. and Texas	8,741	4,388	1,006	.....
Alabama	49,394	95,815	4,393	5,947
Kentucky	6,673	8,067	3,156	1,589
Tennessee	15,174	11,595	1,361	1,559
Ohio	121,621	37,877	18,299	1,303
Michigan and Minnesota	32,708	35,206	6,906	3,441
Illinois and Wisconsin				
Missouri and Colorado				
Pacific States				
Totals	442,370	372,560	70,647	29,861

Furnaces Building.—On June 30 there were 28 blast furnaces in course of erection in the United States, of which 24 will use coke for fuel when completed, 2 will use anthracite coal and coke mixed, and 2 will use charcoal. These furnaces are located in the following States: New York, 4 coke; New Jersey, 1 anthracite and coke; Pennsylvania, 11, of which 1 in the Lehigh Valley will use anthracite and coke, and 6 in Allegheny County, 1 in the Shenango Valley, and 3 in other counties in Western Pennsylvania will use coke exclusively; Virginia, 1 coke; West Virginia, 1 coke; Tennessee, 1 charcoal; Alabama, 2 coke; Ohio, 2 coke, 1 at Cleveland and 1 at Toledo; Illinois, 1 coke; Michigan, 1 coke and 1 charcoal; and Colorado, 2 coke. A few of these furnaces will be completed and blown in before the close of 1902, but the majority will not be ready for blast until 1903. In addition to the new furnaces enumerated above several coke furnaces are projected and a number of old furnaces are to be rebuilt during 1902 and 1903.

About a mile of steel road, consisting of two steel tracks, each about 12 inches wide and set at standard gauge, is to be laid in different sections of New York under the auspices of the Automobile Club of America, to test its practicability under all circumstances in relieving the congestion of traffic in downtown streets and furnishing a perfect speedway for automobiles and other vehicles. It is claimed that street car traffic, which is often delayed by heavy trucks using the tracks in the efforts of the drivers to select the smoothest part of the street, will be greatly benefited. Charles M. Schwab, president of the United States Steel Corporation, has taken a lively interest in the project, and has donated sufficient steel for laying the experimental mile. It is expected that the road will be laid this fall.

Production of Manganese Ore in 1901.

WASHINGTON, D. C., July 29, 1902.—The Geological Survey has completed the annual report upon the production of manganese ores in 1901, which has been prepared by John Birkinbine. The statistics show a small increase in the production of manganese ores and a very large increase in the output of manganiferous iron ores.

The total production of manganese ore in the United States during 1901 amounted to 11,995 long tons, valued at $116,722, an average of $9.73 per ton. This was an increase of 224 tons, or about 2 per cent., from the 1900 output of 11,771 long tons, but the average value increased from $8.52 in 1900 to $9.73 in 1901, or $1.21 per ton. In 1901 eight States contributed to the total, Alabama, Missouri and Utah being added to the 1900 list. Montana, a former producer, reported no ore mined. Virginia, as in 1901, headed the list, Georgia being second and Utah third.

The following figures show the production and value of the manganese ores in 1901: Alabama, 17 long tons, value $111; Arkansas, 91 tons, value $657; California, 610 tons, value $3610; Georgia, 4074 tons, value $24,674; Missouri, 28 tons, value $280; Tennessee, 400 tons, value $3787; Utah, 2500 tons, value $31,250; Virginia, 4275 tons, value $52,853. Total, 11,995 tons, value $116,722. It will be seen that Virginia, Georgia and Utah combined produced 10,849 tons, or 90 per cent. of the total for the United States.

Manganiferous Iron Ores.

The total production of manganiferous iron ores during 1901 was 574,489 long tons, valued at $1,475,084, an average value per ton of $2.57. The output of the Lake Superior region amounted to 512,084 tons, valued at $1,266,952, an average value of $2.40 per ton, these ores carrying from 1 to 10 per cent. of manganese. Except in a few cases the amount did not exceed 1 per cent. The production of Colorado was 62,385 long tons, valued at $248,084, or an average value of $3.98. The percentage of manganese in the Colorado ores ranged from 16 to 30, and the product of this State and a portion of the output of the Lake Superior region were utilized in the manufacture of spiegeleisen. North Carolina mined, as a prospect, 20 tons of manganiferous ore, which was not shipped and of which the definite composition is unknown.

During 1901 228,187 long tons of manganiferous silver ores were produced, having a value of $865,159, or an average value per ton of $3.79. These ores carried an insufficient percentage of silver to make them valuable on that account. In addition to the manganiferous iron and silver ores there were produced in 1901 52,311 tons of manganiferous zinc ore, or clinker, obtained by roasting the franklinite ores of New Jersey to extract the zinc. This clinker was employed in the production of spiegeleisen.

Development of Manganiferous Ores.

Alabama.—This State contributed a small lot of 17 tons of manganese ore in 1901.

Arkansas.—A decade ago Arkansas was the principal manganese producing State in the Union, but in late years has shown a decadence, gradually declining from 3421 tons in 1896 to but 91 tons in 1901. All of this ore comes from the Batesville district. There are numerous deposits of ore in this State carrying satisfactory percentages of manganese, but the high phosphorus content, in addition to the distance from the point of consumption and the expense of mining, has rendered much of it unmarketable.

California.—Exploited deposits of manganese ore occur in the counties of Alameda, Marin, Napa, San Benito, San Luis Obispo, Santa Clara and Sonoma, but only those in Alameda County are operated. The amount reported during the year 1901, 610 tons, is the largest since the year 1891.

Colorado.—Considerable amounts of both manganiferous iron ores and manganiferous silver ores are annually mined in Colorado, principally in the Leadville district, the former being used by the steel works in the production of spiegeleisen and the latter being utilized as a flux by the smelters. There are also other argentiferous and manganiferous ores which contain enough of the precious metals to make them valuable on that account, and which are, therefore, not considered in this report. In addition to 62,385 tons manganiferous iron ores, manganiferous silver ores were produced in Colorado in 1901 to the amount of 228,187 tons.

Georgia.—In 1901 the Cave Spring district and the Cartersville district both mined manganese ore, the latter being the principal producer. The total output for the year was 4074 long tons, the largest production since 1898.

Lake Superior Region.—In this region considerable amounts of iron ore are obtained carrying from 1 to 10 per cent. of manganese. Of the total production of 1901, which amounted to 512,084 long tons, approximately 245,000 tons carried under 5 per cent. of manganese, and the remainder from 5 to 10 per cent.

Missouri.—Twenty-eight tons of manganese ore were obtained in this State in 1901, but it is uncertain whether the shipments will continue.

Tennessee.—This State reported in 1901 an output of 400 tons, which is its largest production of manganese ore since the Survey began collecting these records.

Utah.—A manganese deposit has been developed near Thompson, Utah, and a wagon road 16 miles long has been built from the mine to the Little Grand. About 2500 tons were broken down at the mine during the year, of which 500 tons were shipped to steel works at Pueblo, Col., and Chicago, Ill. The deposit is reported as lying between bedding planes of Triassic sandstone, the ore yielding 42 to 58 per cent. of manganese. Indications are favorable for obtaining a liberal supply from this deposit.

Virginia.—The amount mined in 1901 was but 4275 tons, which is about the average for the past ten years, though much below the production from 1885 to 1891, when the output averaged about 16,000 tons.

Imports.

The amount of manganese ores imported into the United States during the year 1901 was 165,722 long tons, valued at $1,486,573, or $8.97 per ton, as compared with imports of 256,252 long tons, valued at $2,042,361, or $7.97 per ton, in 1900. The United States is the largest producer of steel in the world, and in the production of this steel a large amount of ferromanganese and spiegeleisen is used. In 1901 the foreign ferro and spiegel were attractively low in price, so that a number of the larger companies preferred to import such manganese metal as might be required rather than to manufacture it. This will account for the falling off in imports of manganese ores in 1901.

The principal shippers to the United States in 1901 were Brazil, Russia, Cuba, Turkey, Chile and India, in the order named. The importation by customs districts shows that over half of the total foreign manganese ore was received at the port of Baltimore and about one-seventh at Philadelphia.

According to the latest obtainable figures the production of manganese ore for 1901 may be estimated for the most important producing countries as follows: Russia, 646,582 long tons; India, 130,670 long tons; Brazil, 95,710 long tons; Spain, 90,224 long tons; Germany, 58,269 long tons; Turkey, 38,100 long tons; Chile, 31,477 long tons, and Cuba, 25,183 long tons.

Jones & Laughlin Steel Company.

Official announcement is made that the partnership of Jones & Laughlins, Limited, Pittsburgh, will, on August 1, transfer their properties and assets to the Jones & Laughlin Steel Company, incorporated under the laws of Pennsylvania, with a capital of $30,000,000, book value. An issue of $10,000,000 bonds has also been provided for, part of which will be used in improvements and enlargements of plants

It is not the present intention to place any of the stock or bonds on the market, the change being made on account of the early expiration of the present partnership by limitation and the more enduring form of commercial existence and better facilities secured under corporate

laws. No change, however, is contemplated in either the ownership or policy of the company.

The subsidiary companies of Jones & Laughlins, Limited, which will be taken over by the new company, are the Vester Coal Company, Inter-State Iron Company, Blair Limestone Company, Limited; Monongahela Connecting Railroad Company, Blair Supply Company, Limited, and the Angelina Dock Company.

The officers and directors will be B. F. Jones, Jr., president; Willis L. King, vice-president; William Larimer Jones, general manager; Irwin B. Laughlin, treasurer; T. K. Laughlin, assistant treasurer; W. C. Moreland, secretary; Wendell Van Hook, auditor; directors, B. F. Jones, H. A. Laughlin, G. M. Laughlin, James Laughlin, Jr., B. F. Jones, Jr., Willis L. King, William Larimer Jones, Thomas O'Conor Jones, Irwin B. Laughlin, J. B. Laughlin, W. C. Moreland, Roland Gerry, W. A. Willock, Robert Giddis and Henry S. Kiehl.

Production of Tin and Terne Plate.

Abstract of Census Report for 1900.

William G. Gray, acting as expert special agent for iron and steel, has prepared for the Census Bureau a report on the manufacture of tin and terne plate. Statistics for this industry were not separately collected in 1890, the production being very small in that year. During the following decade, however, the development was remarkable, and in 1900 the United States had assumed a leading position in the production of tin and terne plate, consuming over three-eighths of the world's estimated production of pig tin in 1900.

The first table is a summary of the statistics of the tin and terne dipping and black plate industries, as follows:

	Total.	Tin and terne dipping industry.	Black plate industry.
Number of establishments	*66	57	44
Capital	$27,488,302	$6,790,047	$20,698,255
Number salaried officials, clerks, &c.	726	333	393
Salaries	$818,015	$291,323	$526,692
Wage earners, average number	14,826	3,671	11,155
Total wages	$10,288,061	$1,889,917	$8,398,144
Miscellaneous expenses	$505,128	$236,456	$268,672
Cost of materials, including mill supplies, freight, &c.	†$45,004,716	$26,728,150	$18,276,566
Value of products, including custom work and repairing	†$61,912,619	$31,892,011	$30,020,608

* Includes 35 plants which manufactured black plates as well as tin and terne plates, 22 plants which manufactured tin and terne plates only, and 9 plants which manufactured black plates only.

† Includes a duplication of $20,590,566, the value of black plates reported among the products of the black plate industry and used as material in the tin and terne dipping industry.

While it might appear from this table that 101 establishments were engaged during the census year in the combined industries this was not the case, since establishments which performed both operations—namely, the manufacture of black plates and the dipping of these plates—would thus be counted twice.

Thirty-five active dipping establishments, or a majority of the whole number, were equipped also for the manufacture of black plates. In addition there were 22 active plants equipped for tin and terne dipping only and nine active plants equipped for the manufacture of black plates only, or a total of 66 active plants.

The Dipping Industry Regarded Separately.

Following is a summary of the tin and terne dipping industry:

Number of establishments	57
Capital	$6,790,047
Salaried officials, clerks, &c., number	333
Salaries	$291,323
Wage earners, average number	3,671
Total wages	$1,889,917
Miscellaneous expenses	$236,456
Cost of materials used, including mill supplies, freight, &c.	$26,728,150
Value of products, including custom work and repairing	$31,892,011

The next table shows the quantity and cost of materials used during the census year in the 57 active tin and terne dipping establishments:

Materials.	Unit of measure.	Quantity.	Cost
Total	....	.....	$26,728,150
Domestic black plates or sheets for tinning	Pounds	825,556,992	20,590,566
Foreign black plates or sheets for tinning	Pounds	2,358,607	78,282
Pig tin	Pounds	20,282,778	4,528,473
Pig lead	Pounds	6,871,480	398,617
Palm oil	Pounds	5,511,645	282,227
Sulphuric acid, tinning flux, bran and pink meal	....	.....	187,318
Boxes and nails	....	.....	303,316
Fuel:			
Anthracite coal and culm	*Tons	4,456	6,465
Bituminous coal and slack	*Tons	35,048	48,059
Coke	*Tons	975	2,000
Charcoal	Bushels	556	122
Natural gas	....	.....	34,110
Oil	....	.....	700
All other materials, including mill supplies, freight, &c.	....	.....	†267,895

* Tons of 2240 pounds.

† In some cases the cost of freight is included in the cost of materials, it not being practicable to secure the cost of freight separately.

The quantity and value of the tin and terne plates and other products of the 57 active tin and terne dipping establishments, by States, for 1900, are shown in the following table:

States.	Pounds.	Value.
Tin Plates.		
United States	707,718,239	$25,553,021
Illinois	47,296,727	1,999,489
New York	5,591,050	258,199
Ohio	132,163,383	4,623,930
Pennsylvania	256,879,332	9,137,483
*All other States	265,787,747	9,533,920
Terne Plates.		
United States	141,285,783	$5,731,124
New York	3,900,000	205,000
Ohio	30,146,921	1,176,773
Pennsylvania	77,129,648	3,263,769
*All other States	30,109,214	1,085,582

* Includes establishments distributed as follows: Indiana, 5, all controlled by one company; Kentucky, 1; Maryland, 2; Michigan, 1; Missouri, 1; Virginia, 1; West Virginia, 2.

The Black Plate Industry.

Following is a summary of the statistics for the 44 establishments which were engaged in whole or in part in the black plate industry during the census year:

Number of establishments	44
Capital	*$20,698,255
Salaried officials, clerks, &c., number	393
Salaries	$526,692
Wage earners, average number	11,155
Total wages	$8,398,144
Miscellaneous expenses	$268,672
Cost of materials used	$18,276,566
Value of products	$30,020,608

* Includes rented property valued at $25,000.

More than nine-tenths of the black plates manufactured were made from Bessemer steel and less than one-tenth from open hearth steel. No iron black plates were reported by any of the 44 active establishments. The average value of all kinds of black plates for tinning was $53.21 per ton. The Bessemer black plates averaged $52.59 per ton and the open hearth black plates $58.93 per ton. The value of all billets and sheets and tin plate bars produced for sale by black plate establishments, which amounted approximately to $1,894,000, is included in the "value of all other products."

The total production of Bessemer and open hearth steel black plates in 1900 was 882,591,360 pounds, of which 795,372,480 pounds were Bessemer steel and 87,218,880 pounds were open hearth steel. These figures do not include the 79,096 tons of plates and sheets other than black plates for tinning produced by black plate mills during the census year.

Statistics of the Entire Industry.

The production of tin and terne plates from July 1, 1891, to December 31, 1901, was as follows:

	Pounds.		Pounds.
1891*	2,236,743	1897	574,779,000
1892	42,119,192	1898	732,289,000
1893	123,606,707	1899	808,360,000
1894	166,343,409	1900	677,969,000
1895	254,611,395	1901	894,411,000
1896	359,209,798		

* Last six months.

The outlook for the future growth of the industry is exceptionally bright, as the demand for tin and terne plates will undoubtedly increase year by year as new uses for both products are discovered and developed. It is possible, too, that as the productive capacity of the domestic tin dipping plants increases both tin plates and terne plates may form important features of our expanding export trade. A start in this direction has already been made, as shown by the figures of the Treasury Department for the fiscal year ending with June 30, 1901, when 1,367,405 pounds of domestic tin plates, terne plates and taggers tin were exported, valued at $66,550. Of this total 6300 pounds, valued at $401, were sent to the United Kingdom.

The following table shows interesting details by States:

States.	Number of establishments.	Capital.	Value of products, including custom work and repairing.
United States	57	*$6,790,047	$31,892,011
Illinois	3	413,055	2,081,837
New York	4	245,579	463,199
Ohio	12	1,203,265	6,023,314
Pennsylvania	25	3,042,029	12,530,991
†All other States	13	1,886,119	10,792,670

* Includes rented property valued at $140,000.
† Includes establishments distributed as follows: Indiana, 5, all controlled by one company; Kentucky, 1; Maryland, 2; Michigan, 1; Missouri, 1; Virginia, 1; West Virginia, 2.

OBITUARY.

CAPT. E. A. C. LOHMANN, a widely-known steel expert, died at Bethlehem, Pa., on July 21. He was a native of New Haven, Conn., and was formerly prominent in the National Guards of Connecticut and New Jersey.

ASABEL CLARKE GEER, for 18 years secretary and general manager of the Walter A. Wood Mowing & Reaping Machine Company, Hoosick Falls, N. Y., died on July 17 at his summer home at Williamstown, Mass. Mr. Geer was born 80 years ago at Glens Falls, N. Y., and in the earlier portion of his life had practiced law in Troy, N. Y. He retired from business in 1886.

W. H. PATTERSON, a prominent dealer in railroad supplies, Cleveland, Ohio, died on July 21, aged 45 years.

J. R. SEARLES has resigned the management of the Fox plant of the Pressed Steel Car Company, at Joliet, Ill.

COL. SAMUEL LAMARTINE VARNEDOE, president of the Tampa Hardware Company, Tampa, Fla., died on Thursday, July 17.

A striking evidence of the general condition into which the British iron and steel trade has fallen is furnished in the contemplated action of the directors of the Ebbw Vale Iron, Steel & Coal Company. The company mine about 1,250,000 tons of coal a year, and manufacture Bessemer and open hearth steel. Profits have been very unsatisfactory, and the directors have under serious consideration the entire abandonment of pig iron and steel manufacture, there being evidence that the mere mining of coal would produce greater revenue. This is despite the fact that Bessemer plant has lately been modernized—in the British sense—and the open hearth department was but recently added. Profits last year were less than $300,000, which could have been earned by 25 cents a ton on the coal mined. Other Welsh companies, somewhat similarly situated, abandoned steel making some years ago, and it does not appear that the poorer prospects for steel making in Wales have been accompanied by any brighter prospects in other portions of Great Britain.

The Monongahela River Consolidated Coal & Coke Company of Pittsburgh have plans made to turn a production of 3,000,000 tons to the market next year over railroad tipples. This effectually ends the contract between that company and the Pittsburgh Coal Company, that the latter devote themselves exclusively to rail traffic and the former to river traffic. It proves that the trade conflict between the two companies has taken tangible form.

MANUFACTURING.

Iron and Steel.

The Colonial Steel Company of Pittsburgh, whose crucible steel works at Colonia, Pa., have been under construction for some months, have about finished their plants. The new blooming mill has been started, while the other departments of the plant have been in operation for some time. Work has been started on the erection of four more furnaces. Two of these are to be ready by August 15 and the other two by September 1. The company have large orders on hand for their various brands of steel.

The plant of the Parkersburg Iron & Steel Company, at Parkersburg, W. Va., manufacturers of iron and steel sheets, is to be much enlarged. A new annealing furnace is to be added and the rolling mill building will be considerably enlarged. Early in August the bar mill, which has been under erection for some time, will be started. Work on the building of this bar mill has been considerably delayed on account of difficulty in getting machinery.

Jones & Laughlins, Limited, of the American Iron & Steel Works, Pittsburgh, have secured options on a large amount of ground located near their works, which will be utilized at some future time for large extensions to their plant. It is possible that they may also acquire the property of the Republic Iron Works on the South Side, located near their plant. The Republic Iron Works are owned by the National Tube Company, the output being skelp. It is intimated that when the proposed new works of the National Tube Company are built at McKeesport the Republic plant may be abandoned.

It is stated that the new works of the National Rolled Steel Car Company will be located at Mercer, Pa.

The Scott street plant at Joliet of the American Steel & Wire Company resumed operations on July 21. During the period of the shut-down for repairs a fire protection sprinkling system was installed in the various departments.

Press dispatches from Detroit announce that there is a project on foot to reinstate the furnace of the Peninsular Iron Company, which has been idle for a year, and the Detroit furnace at the foot of Meldron avenue, among the active stacks. The Peninsular property was sold a few days since at auction to Fred L. Smith, secretary of the Olds Motor Company. The price paid was $42,000. The urgent demand for iron during the past few months is said to be the incentive for preparing these two furnaces for active operation.

The United Steel Company, who are to construct a new plant at Canton, Ohio, to supply independent sheet steel manufacturers with billets and sheet bars, have incorporated with a capital stock of $500,000.

The Andrews & Hitchcock Iron Company have completed repairs to their No. 1 furnace, at Hubbard, Ohio, and both their stacks at that place are now in operation.

The Nickel Steel & Forge Company, at Carnegie, near Pittsburgh, have purchased the idle plant of the Virginia Nail & Iron Works, at Reusens, Campbell County, Va., and removed the trains of rolls, &c., to the Carnegie works. The Reusens plant was built to make guide iron, round, square and flat bar iron, and light T rails. It was located near Lynchburg. The Nickel Company manufacture Damascus tool steel and also nickel steel, an alloy of nickel and steel, and this latter product is now coming into use for bridles, hames, piano wire and similar light products. The process by which this alloy is made, as well as the Damascus steel, is controlled by patents. The president of the American Nickel Steel Company, owners of the patents, is B. K. Jamison, whose office is at 312 Bullitt Building, Philadelphia. The Pittsburgh office of the Nickel Steel & Forge Company is in the Westinghouse Building.

The Northside Iron Company have practically completed their new furnace at Sharpsville, Pa. The stack is 35 x 7 feet. Connellsville coke and Lake Superior ore will be used and Bessemer and foundry pig iron will be made. Its estimated annual capacity is about 18,000 gross tons. The furnace will be ready for blast early in August. S. A. Robinson is president, Andrew Nickel is vice-president and C. B. Kantner is secretary and treasurer.

The puddling department of the Eagle Works of the Republic Iron & Steel Company, at Ironton, Ohio, is being operated on three turns very successfully, and it is the intention, commencing August 4, to begin running the 9-inch guide mill in this plant three turns also.

Mary Furnace of the Ohio Iron & Steel Company, Lowellville, Ohio, has started up after being relined and otherwise repaired. The furnace is doing very nicely, making about 300 tons of iron per day.

Within a short time everything at the sheet plant of the Monarch Iron & Steel Company, at Parkersburg, W. Va., will be in as good or better condition than it was before their main building was blown down recently by a storm. Work has been started on a boiler house, 38 x 53 feet, while the main building will be heavily reinforced and its strength considerably increased. The company have received the shears for the plant, and the Morgan Engineering Company, at Alliance, Ohio, will ship them a large anvil block this week weighing about 52,000 pounds.

The report that Fannie Furnace of the Cherry Valley Iron Company, at Sharpsville, Pa., had been blown out on account of failure of supply of coke is untrue. The stack is in operation and has been right along.

The Dewey Iron & Steel Company of Pittsburgh, recently granted a charter, propose to build and operate a blast furnace at Brady's Bend, Pa.

The George A. Hogg Iron & Steel Foundry Company of Pittsburgh, Pa., manufacturers of rolling mill machinery, are equipping the annealing furnaces of the National Works of the American Tin Plate Company, at Monessen, Pa., also their United States Works at Demmler, Pa., and their American Works at Elwood, Ind., with the Freeman furnace charger.

The Liggett Spring & Axle Company, manufacturers of high grade carriage and wagon springs and axles, whose plant is now located in Allegheny, Pa., are going ahead rapidly with their plans for building a new works near Monongahela City, Pa. The company have secured at this place a tract of 150 acres, on which the new plant will be built, and the main building will be 600 feet long. Contracts have been given to the McClintic-Marshall Construction Company, Park Building, Pittsburgh, Pa., for the erection of the buildings, all of which will be of steel, except the boiler house. The Coshocton Iron Company, recently organized at Pittsburgh, and who are a constituent interest of the Liggett Spring & Axle Company, will also erect a plant on this new tract.

General Machinery.

The Gustafson Bros. Mfg. Company, Sequachee, Tenn., manufacturers of furnace supplies in brass and iron, mining cars, wheels, supplies, &c., have leased the plant of the Chickamauga Foundry & Machine Company, Chattanooga, where they will shortly remove their plant. As soon as they get settled in their new quarters they intend to put on the market a self starting centrifugal pump of original design and a full line of Gustafson's patent straightway globe and angle valves for steam and water.

The Goulds Mfg. Company of Seneca Falls, N. Y., report a very heavy demand for all of their different styles of pumps. This is especially true of their line of large triplex power pumps, for which they have recently erected a special plant. They are so heavily filled with orders that they are in great need of additional molders and machinists, and have permanent employment for a number of new men if they could get them.

The Delaware Marine Supply Mfg. Company, Wilmington, Del., recently incorporated with a capital stock of $100,000, are erecting a plant for the manufacture of ships' fittings of all classes. The plant will include a foundry, machine shop, office and other buildings, all of which will be equipped with the most modern appliances, especially adapted to the lines they propose to make. The officers are: C. F. Petersen, president; C. L. Bonham, secretary, and Louis Werlin, treasurer.

The A. H. Nilson Machine Company, Bridgeport, Conn., have plans completed for the addition they are to erect on property recently purchased. The building will be about 40 x 150 feet, two stories.

P. M. Sharples, West Chester, Pa., manufacturer of cream separators and dairy appliances, is enlarging his plant to nearly double the present capacity. The improvements consist of an extensive addition to the foundry and an addition, 50 x 350 feet, to the machine shops, the latter just completed. Mr. Sharples advises us that he had to refuse orders for a large number of cream separators this season because he could not supply them.

The Great Barrington Electric Light Company, Great Barrington, Mass., are to enlarge their plant, and have leased from P. A. Russell the water power and wooden mill of the woolen company. The mill will be fitted up with machinery with which to supply power, and the plant will be run in connection with the station at Housatonic. The company have recently had many applications for power, which they have been unable to furnish.

The Reading Power Company, Reading, Pa., recently organized, will erect a $1,000,000 power plant in that city. The company intend to supply every city and town in Berks County with power. John A. Rigg is president.

The Estes Mfg. Company, Rochester, N. Y., recently organized, have purchased the manufacturing business of the Machinists' Supply Company of that city, and will manufacture power transmission equipments, leather belting, &c., and will engineer and contract for complete power plants.

The machinists' strike at the Marinette Iron Works, Marinette, Wis., has been settled after three weeks' duration. The new scale of 52 hours a week went into effect on June 26.

The plans for the new plant of the Cleveland Pneumatic Tool Company, Cleveland, Ohio, are about completed, and contracts will be let at an early day for the construction of the buildings. The company have just opened up an office at 411 Park Building, Pittsburgh, Pa., represented by Chas. L. Nelson, and at 34 Lemoine street, Montreal, Canada, represented by N. J. Holden & Co.

The West Penn Foundry & Machine Company, Avonmore, Pa., have signed the machinists' scale recently adopted at Pittsburgh.

The William Tod Company, engineers, founders and machinists, Youngstown, Ohio, are considerably enlarging their plant. They have given a contract to the American Bridge Company for the erection of the following buildings: Erecting shop, 70-foot span, 70 feet high and 200 feet long; machine shop, 50-foot span, 50 feet high and 200 feet long. They have also closed contracts for considerable iron working machinery, including a 14-foot planer from the Pond Machine Tool Company, Plainfield, N. J.; a 24-foot boring mill from the Niles Machine Tool Company, Hamilton, Ohio, and a 10-inch boring and milling machine from the William Sellers Company, Incorporated, of Philadelphia.

The machinists employed by the Pennsylvania Engineering Works, New Castle, Pa., are on strike for a 10 per cent. advance in wages. The men rejected an offer of a 5 per cent. advance.

Among the recent contracts awarded to the Buffalo Forge Company of Buffalo, N. Y., is that of the Continental Coal Company of Glouster, Ohio, for three 250-inch fans to be installed in their mines for the purpose of ventilating and exhausting fumes, smoke and all dangerous gases constantly met with in coal mining, is of particular interest. The fans are 250 inches, housings of the three-quarter type and of the special width of 72 inches. This plant is similar in many respects to that of the Modoc Coal Mining Company, located at the same place and recently installed by the Buffalo Forge Company.

Boilers, Engines, &c.

The Wheeling & Lake Erie Railroad have placed an order with the Baldwin Locomotive Works of Philadelphia for a large number of locomotives. In the order are eight-wheel passenger engines, each of which has a total weight of 134,000 pounds, with cylinders 19 x 26 inches. The boilers are extended wagon top, 62 inches in diameter, and will carry 200 pounds pressure. The fire box is 108 x 40 inches, giving a grate area of 30 square feet. The boiler contains 310 2-inch tubes and has a total heating surface of 2208 feet. These are the engines that will likely be put into service on the new line into Pittsburgh. They will be ready by the time the line is completed. The 20 consolidated compound freight engines ordered will weigh 185,000 pounds and will have 23 and 35 x 32 inch cylinders. There will be also four six-wheel and two four-wheel switch engines.

Wallace H. Rowe of the Pittsburgh Steel Company, William L. Abbott, formerly of the Carnegie Steel Company, and Alan W. Wood of the American Sheet Steel Company are among the incorporators of the Shady Side Electric Light Company, who have applied for a charter and will supply light, heat and power by means of electricity to residents of the East End, Pittsburgh.

Walter Loring Webb, Morgantown, W. Va., engineer in charge, informs us that boilers and engines, horse-power not yet decided, railway generators, dynamos for lighting and other equipment are required for the improvements to be made by the Morgantown Electric & Traction Company. These will consist of the building of several miles of electric road, reconstruction of the existing incandescent lighting system and the erection of a large power station. Plans will be ready and bids asked within two months.

The Weimer Machine Works Company of Lebanon, Pa., are building the following blowing engines: Two 50 x 96 x 60 inch engines for the Atlantic Iron & Steel Company, New Castle, Pa.; two of the same size for the Hannah and Hazleton furnaces of the Republic Iron & Steel Company, Youngstown, Ohio; two 42 x 84 x 60 inch for the La Belle Iron Works, Steubenville, Ohio, and one 50 x 96 x 60 for the Claire Furnace Company, Sharpsville, Pa. They are now using aluminum discharge valves with satisfactory results, blowing 20 to 25 pounds air pressure, with no wear on the valves.

W. G. Kirchoffer of Baraboo, Wis., and Daniel W. Mead of Chicago are preparing plans for a new source of water supply and a pumping plant for the former place. Details are not yet decided upon, but it is probable that two sets of pumps, one to pump from deep wells and one for pressure service, will be used. It will be a steam plant and up to date in every respect.

Fires.

The Winslow Bros. Company, manufacturers of wrought iron, Elizabeth street and Carroll avenue, Chicago, suffered a loss estimated at $50,000 from fire on July 24. Five thousand dollars of the loss was on the building and the remainder on stock.

The Johnson Foundry & Machine Works, Paducah, Ky., were recently destroyed by fire, entailing a loss of about $15,000.

The plans of the Owensborough Planing Mill Company and the Continental Tobacco Company, at Owensborough, Ky., were destroyed by fire July 23. The loss is about $100,000.

Foundries.

The Lynchburg Plow & Foundry Company, Lynchburg, Va., have purchased property adjacent to their plow works, upon which they will erect a plant for the manufacture of cast iron pipe. A large machine shop will also be built. The company are now placing orders for equipment, exclusive of cranes and pipe foundry equipment, which they will make themselves. The engine, 125 horse-power, has been secured.

The Newport News Shipbuilding & Dry Dock Company, Newport News, Va., have purchased the foundry of the Peninsular Foundry Company, which has a daily capacity of 10 tons. This makes the second foundry the company have purchased within the last few months.

The National Iron Company, West Duluth, Minn., are making rapid progress in fitting their plant for turning out heavy forgings and castings. The machinery for the pattern room has already been installed, and the blacksmith shop will be ready for operations within a few days. In the machine shop the old tools are being transferred and recent and new machinery installed. The foundry is already in full operation with heats being taken almost daily. Two heavy castings, one of 6½ and one of 7 tons, for the Duluth blast furnace have been cast during the past week. The office of the company has been moved to the new location at Fiftieth avenue West.

The Central Malleable Iron Company of Decatur, Ill., have been organized with a capital stock of $60,000, for the purpose of general manufacturing. Following are the incorporators: G. A. Hackett, John P. Utt and T. J. Arnett.

The foundry of the West Superior branch of the United States Cast Iron Pipe & Foundry Company will resume operations about August 1, it having been closed down for repairs and to await the disposal of a large stock of sewer and water pipe now in the yards of the company. The machinery is being cleaned and repaired and the plant is being put in a condition to enable it to continue operations for at least a year's run.

The Best-Scott Foundry & Machine Company of Warren, Pa., have been reorganized under the name of the Allegheny Foundry Company, Limited. They are manufacturers of castings of all kinds in iron, semi-steel and brass. John Best has retired and the officers are now as follows: Ray Heermans, chairman; J. A. Viele, secretary and treasurer, and R. J. Scott, manager.

P. H. MaGirl, Bloomington, Ill., manufacturer of the Mammoth tubular masonry house heating furnaces, Brown's patent stop gate box and patent sectional metal arch culverts, has purchased a site on the Lake Erie tracks, where he will erect a foundry, plans for which have not yet been fully decided upon.

The Fort Wayne Steel Foundry Company, Fort Wayne, Ind., have completed their organization by the election of the following officers: G. Max Hofmann, president; Louis Fox, vice-president; F. E. W. Scheimann, secretary, and Charles S. Bash, treasurer.

The Malleable Iron Fittings Company, Branford, Conn., are commencing work on the additions to their plant mentioned in these columns some time ago. These will comprise an addition to the annealing department, 118 x 200 feet, and a new core shop, 80 x 150 feet, two stories. Both buildings are to be of fire proof construction throughout, with steel trusses and cement floors and roofs. They also contemplate putting up another foundry and steel furnace.

Hardware.

Black Silk Stove Polish Works, Lewis D. Wynn, proprietor, Sterling, Ill., advise us that their Black Silk polish has now been on the market for 16 years without any change in name or keeping qualities, the claim being made that it will withstand any climate from three to five years without drying out. The ease and cleanliness of its application and the brilliant luster of the polish are also pointed out. The company refer to the demand, both domestic and foreign, as ever increasing.

The Snell Mfg. Company, Fiskdale, Mass., manufacturers of boring tools, cold chisels, nail sets, &c., are making a number of repairs to their plant and are also erecting an addition to the main building of their factory, 30 x 40 feet. A new steam plant of brick and separate from the other buildings has recently been added, supplanting water power used heretofore. At their branch factory at East Brimfield, Mass., where all the Snell ship augers are made, it is expected this fall to enlarge the main building by an addition 30 x 30 feet, two stories high.

Miscellaneous.

The Wisconsin Bridge & Iron Company of Milwaukee have 40 men at work erecting buildings at the Trimountain Mine. The men are at work on a new engine house and a new rock house.

The A. T. Stewart Company of Carnegie, Pa., manufacturers of Universal plows, Apex pumps and sprayers, will change their name to the Carnegie Plow & Mfg. Company.

The organization of the Detroit Steel Cooperage Company of Detroit has been announced with a capital of $100,000, of which $65,000 is paid in. The company were organized for the purpose of making steel casks, tanks, &c., for breweries and other concerns using large receptacles for fluids. The directors of the company are as follows: Paul Weidner, Conrad Pfeiffer, Henry Weidner, Fred. Kahl, Oscar Rosenbusch and Charles Rheinwald.

The rolling mill of the Illinois Zinc Company, La Salle, Ill., resumed operations on July 21, after a shut down for needed repairs.

Within a month the Newton Steel Wheel Company, Kalamazoo, Mich., manufacturers of steel buggy wheels, will have their new plant in operation. The building is 65 x 100 feet, five stories, with engine and shipping room, 20 x 40 feet, attached. There is also a warehouse, 40 x 80 feet. The equipment was mostly furnished by the Defiance Machine Company, Defiance, Ohio, and the Bremer Machine Company, Kalamazoo.

A 70 horse-power boiler and engine and a large veneer lathe are required by the Western Veneer & Box Mfg. Company of Tacoma, Wash., recently incorporated with 500,000 capital stock for the manufacture of boxes, barrels, &c. The company will erect a plant at Astoria, Ore. M. J. Payne is president.

The Pennsylvania Coal & Coke Company, Philadelphia, Pa., recently organized for the production of coal and coke, have purchased about 20,000 acres of bituminous coal lands in Cambria County. James L. Mitchell is president. Address for present is with the Webster Coal & Coke Company, North American Building.

The Porter Metal Works, San Francisco, Cal., have added to their galvanizing plant a complete plant for tinning by the dipping process, and are now in a position to handle anything in the galvanizing and tinning line.

The Jefferson Mfg. Company, manufacturers of the Jefferson union and flange, have removed their plant from Woburn, Mass., and their general offices, formerly at 186 Devonshire street, Boston, to Lexington, Mass., where they have double their former facilities.

The Pressed Steel Car Company of Pittsburgh have received an order from the Pennsylvania Railroad for 725 steel cars, mostly drop end and drop side gondolas, to replace "missing numbers" in their regular equipment. This means that the Pennsylvania Railroad will replace every one of their old wooden cars with steel cars, filling in the number of the old car with the same number on a new steel car. This plan is understood to be working in other sections of the country also. The Pressed Steel Car Company now employ about 10,000 men and have enough work on hand to keep the men busy well into next year. The average daily output is from 115 to 120 cars. The company are making extensive improvements at some of their plants. At the plant in Allegheny 500 additional horse-power boiler capacity is being installed. The McKee's Rocks plant is to have a new 1000-ton flanging press. Other machinery, including a 120-inch shear, is also to be added to the works.

PERSONAL.

J. W. Arrott of the Standard Sanitary Mfg. Company of Pittsburgh has gone to Europe.

F. R. Phillips of F. R. Phillips & Sons Company, Philadelphia, has just returned from a three months' trip in England and on the continent making purchases of steel. W. Vernon Phillips sailed on July 19 to follow up the shipments on the various contracts and in connection with new business. The company have shipped a heavy tonnage and have been successful in the quality of material secured.

Edward J. Hamilton of the Carnegie Steel Company has sailed for a three months' trip to Europe.

William H. Singer of Pittsburgh, a director in the Crucible Steel Company of America, has sailed for Europe.

Francis J. Torrance, vice-president of the Standard Sanitary Mfg. Company of Pittsburgh, has been elected a director in the Second National Bank in that city.

Z. McCoy has been appointed night superintendent of the Duquesne Steel Works of the Carnegie Steel Company, at Duquesne, Pa.

John H. Ricketson of the A. Garrison Foundry Company, Pittsburgh, has been elected a director of the South Side Trust Company.

J. C. Bennett, auditor of the Westinghouse Electric & Mfg. Company of East Pittsburgh, sailed for England on Tuesday and will make an inspection of the plants of the British Westinghouse and Electric Mfg. Company in Manchester. Before leaving Pittsburgh Mr. Bennett was given a dinner by his office force.

J. H. Park, a director in the Crucible Steel Company of America, at Pittsburgh, has sailed for Europe.

Alan Wood Smith, formerly general manager of the Eleanor Iron & Steel Company, Irwin, Pa., has resigned to take charge of the new mill being erected by Hyde Brothers & Co. of Pittsburgh, at Clearfield, Pa.

The Iron and Metal Trades.

The very substantial basis on which the Iron trade rests is shown by the heavy transactions in Pig Iron for delivery next year. The buying movement is general, all markets reporting an active demand, which comes from all classes of consumers. The disposition to provide for requirements so far in the future is largely prompted by the present scarcity of Iron and the belief that no great improvement will be experienced for some considerable time. The coal miners' strikes in Pennsylvania and the Virginias drag along with little prospect of an early settlement and the supply of Pig Iron is thus still curtailed for lack of fuel. Consumers who must have Iron are compelled to pay such premiums for early delivery that the prices named for next year are attractive, even though much higher than those paid on contracts running through this year. The Republic Iron & Steel Company were the largest buyers of Bessemer, placing several contracts for 1903 delivery, including one of 30,000 tons. They are reported to have bought in all about 100,000 tons. The scarcity of Foundry Pig Iron continues to disturb Eastern foundrymen, who are obliged to depend more and more on imported Iron.

The situation as to Steel Billets grows easier, the pressure for prompt deliveries having diminished. Domestic makers are of the opinion that they will hereafter be in a position to take care of the trade.

The Rail mills are getting well supplied with work for next year. Orders booked are now estimated at 1,200,000 tons, which, with probably 400,000 tons carried over from this year, will give them 1,600,000 tons, while they have five months more to take additional business before the year opens.

The bridge builders are getting so loaded with work for next year that they are discriminating on fresh business, giving preference to regular customers and standard construction. Deliveries of Structural Material are improving as the mills are increasing their output.

The capacity of Tin Plate factories appears to be in excess of midsummer requirements, some rather large establishments having shut down to await the disposal of an accumulation of product.

Fair orders for Scrap are going abroad, which would be much larger if foreign sources of supply were equal to the demand. Low Phosphorus Scrap is especially desired.

Spelter maintains its strength, spot metal being very scarce.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one month and one year previous.

	July 30, 1902.	July 23, 1902.	July 2, 1902.	July 31, 1901.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	$22.00	$22.50	$22.75	$14.75
Foundry Pig No. 2, Southern, Cincinnati	20.75	20.75	20.75	12.75
Foundry Pig No. 2, Local, Chicago	21.00	21.50	....	15.00
Bessemer Pig, Pittsburgh	21.75	21.75	21.50	15.75
Gray Forge, Pittsburgh	21.00	21.00	21.00	13.75
Lake Superior Charcoal, Chicago	**25.50**	25.00	24.00	17.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	32.00	32.00	32.00	23.50
Steel Billets, Philadelphia	*28.75*	29.50	29.50	26.00
Steel Billets, Chicago	31.00	31.00	....	....
Wire Rods, Pittsburgh	36.00	36.00	36.00	36.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
Spikes, Tidewater	2.00	2.00	2.00	1.80
Splice Bars, Tidewater	1.90	1.90	1.90	1.50
OLD MATERIAL:				
O. Steel Rails, Chicago	18.50	18.50	18.50	13.00
O. Steel Rails, Philadelphia	21.25	21.25	21.50	15.75
O. Iron Rails, Chicago	**24.50**	24.50	24.00	19.00
O. Iron Rails, Philadelphia	24.50	24.50	25.00	19.00
O. Car Wheels, Chicago	21.00	21.00	21.00	16.50
O. Car Wheels, Philadelphia	**21.00**	20.50	20.50	17.50
Heavy Steel Scrap, Chicago	19.00	19.00	19.00	12.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.95	1.95	1.95	1.55
Common Iron Bars, Chicago	**1.90**	1.80	1.75	1.60
Common Iron Bars, Pittsburgh	1.80	1.80	1.80	1.45
Steel Bars, Tidewater	2.00	2.00	1.90	1.60
Steel Bars, Pittsburgh	1.60	1.60	*1.60	1.40
Tank Plates, Tidewater	2.00	2.00	2.00	1.75
Tank Plates, Pittsburgh	1.75	1.75	1.75	1.60
Beams, Tidewater	2.25	2.25	2.25	1.75
Beams, Pittsburgh	2.00	2.00	*1.60	1.60
Angles, Tidewater	2.25	2.25	2.25	1.75
Angles, Pittsburgh	2.00	2.00	*1.60	1.60
Skelp, Grooved Iron, Pittsburgh	2.10	2.12½	2.15	1.80
Skelp, Sheared Iron, Pittsburgh	2.15	2.15	2.25	1.90
Sheets, No. 27, Pittsburgh	2.90	2.90	2.90	3.10
Barb Wire, f.o.b. Pittsburgh	2.90	2.90	2.90	2.90
Wire Nails, f.o.b. Pittsburgh	2.05	2.05	2.05	2.30
Cut Nails, Mill	2.05	2.05	2.05	2.00
METALS:				
Copper, New York	*11.75*	11.87½	12.12½	16.50
Spelter, St. Louis	*5.05*	5.10	4.85	3.80
Lead, New York	4.10	4.10	4.10	4.37½
Lead, St. Louis	3.97½	3.97½	3.97½	4.27½
Tin, New York	*28.10*	28.25	28.00	28.00
Antimony, Hallett, New York	*8.00*	8.25	8.37½	8.75
Nickel, New York	*40.00*	50.00	50.00	60.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	4.19	4.19	4.19	...

* Official quotations.

Chicago.

FISHER BUILDING, July 30, 1902.—(*By Telegraph.*)

There is nothing in sight to indicate any falling off in business in either Iron or Steel. While individual orders for Pig Iron have been smaller and the aggregate tonnage somewhat less than a week ago, there is an active demand from small consumers as well as from large companies and at the close there is evidence of even larger buying; the market for both Northern and Southern Iron continues to harden; the demand for deliveries during the current year is increasing and becoming more urgent. The effort to bring about more satisfactory conditions in the Bar Iron market is meeting with more success, and while low prices were made a week ago, to-day it is difficult to place an order under 1.90c., with the demand stimulated by the advancing tendency. The demand for Rails from various Western railroads is by no means over, there being contracts pending in the market for upward of 200,000 tons. The difficulty of obtaining earlier delivery than the middle of October is delaying consummation, and some business is being taken by Eastern mills in spite of the higher freight rates which must be paid for shipment in this section. The demand for Structural Material, and especially for bridge work, continues on a liberal scale. Here, too, the inability of the works to make what is considered by the buyer reasonable delivery is retarding to the trade. It is claimed that some bridge works in this section can take no more business for delivery inside of a year, and it is even stated that some contracts will require two years to fulfill. Contracts for six more lake steamers have been placed during the week. Part of the Structural Material required for these steamers has been placed, for several it seems that contracts have not

yet been placed nor have they appeared in the market. Some further liberal orders for Cast Iron Pipe have been taken in the East, and smaller ones in the West. The buying of foreign material shows but little falling off, about 500 tons of Beams and Angles and 2000 tons of Billets having been placed during the week for shipment beginning in August. There has been renewed buying of Spring and Tire Steel by carriage manufacturers and some important contracts for Agricultural Steel for next year's delivery have been placed during the week.

Pig Iron.—While there have been fewer large individual sales and necessarily a less heavy tonnage, the demand for Pig Iron has continued active with some evidence that the buying movement is broadening, the smaller consumers being ready and willing to place orders for next year's delivery. The aggregate sales for the week were about 50,000 tons. With the exception of one large contract for 20,000 tons, placed by a manufacturer of machinery, orders have been relatively small, not exceeding 1500 tons each. Among the sales may be mentioned 20,000 tons, in lots of 10,000 each, of Low Silicon Iron, about half Southern and half Northern; about 10,000 tons of Southern Nos. 1, 2 and 3, in lots of 1000 to 1500 tons each; 5000 tons of Northern brands Foundry grades ranging from 5 to 1200 tons and about 4500 tons of Southern Foundry, Nos. 1 and 2, in lots of 500 to 1500 tons each, all for delivery during the first six months of 1903. In addition, 3000 tons of Malleable Bessemer at prices ranging from $22 to $23.50 for October, November and December delivery of this year; 300 tons, ditto, at $23. Very little, if any, spot Furnace Iron—that is, for shipment direct from producers—is available, most of the spot Iron offered and sold being resales. Among the contracts placed have been single cars up to 100 tons of Nos. 1, 2 and 3 Southern Foundry, at prices ranging from $24.65 to $26.15. There continues to be a very narrow margin between the grades for the Iron wanted for urgent delivery, and in a number of cases No. 2 and No. 1 are selling at the same price. There have also been sales of 200 tons of White Iron at $21.15, spot. The conditions that have militated against an ample supply of quick delivery Iron continue to have as important bearing upon the market now as a month or two ago, and there is but little relief in sight. It is notable, too, that some of the largest consumers in the Central West are being pressed for Iron for current use, and the constantly increasing demand for lots ranging from 1000 to 2000 tons, for delivery during the last quarter of the year indicates either that the consumers are not covered or that they are making an effort to protect themselves from slow delivery on contracts already placed. More Southern furnaces are reported sold up for the first half of next year, while others have taken orders to such an extent that they will not entertain business for the first three months of the year unless deliveries extend through to July. Several of the Northern stacks are also so well sold ahead that they are very independent and there is a disposition shown this week to advance prices 50c. to $1 a ton, but as yet no action has been taken. The Southern producers continue to sell mainly on the basis of $17 for No. 2 Foundry, Birmingham, all business being taken at the furnaces, the advance in freight rates, which seems inevitable, to be borne by the purchaser. As indicated last week, the following prices are revised to conform to the character of the business now being negotiated, of which nine-tenths, perhaps, is for next year's delivery. Premiums of $2 to $3 per ton are being obtained on contracts for the current year, especially the last quarter, and premiums of $5 to $6 per ton are being obtained for spot delivery. The following are the prices current for delivery during the first six months of 1903:

Lake Superior Charcoal	$25.00 to $26.00
Local Coke Foundry, No. 1	21.50 to 22.00
Local Coke Foundry, No. 2	21.00 to 21.50
Local Coke Foundry, No. 3	20.50 to 21.00
Local Scotch, No. 1	22.00 to 22.50
Ohio Strong Softeners, No. 1	24.00 to 24.50
Southern Silvery, according to Silicon.	24.65 to 25.15
Southern Coke, No. 1	21.40 to 21.90
Southern Coke, No. 2	20.65 to 21.15
Southern Coke, No. 3	20.15 to 20.65
Southern Coke, No. 1 Soft	21.15 to 21.65
Southern Coke, No. 2 Soft	20.65 to 21.15
Foundry Forge	19.65 to 20.15
Southern Gray Forge	19.15 to 19.65
Southern Mottled	19.15 to 19.65
Southern Charcoal Softeners, according to Silicon	25.00 to 26.00
Alabama and Georgia Car Wheel	26.50 to 27.00
Malleable Bessemer	22.00 to 23.00
Standard Bessemer	23.00 to 24.00
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon	26.00 to 27.00

Bars.—While the market has continued unsettled, there has been a gradually firmer tone developed, resulting in a more determined effort to obtain remunerative prices on the basis of current prices for raw material. Sales were made early in the week at 1.85c., and even at 1.80c., but since Monday of this week most of the business, both for immediate shipment and for next year's delivery, has commanded 1.90c., with small sales at 1.95c. There was a meeting of the Bar Iron mills of the Central West in Chicago Monday, and while the results were not all that was anticipated, the opinion seemed to prevail that any business taken below 1.90c. was at a loss. As usual when there is evidence of prices advancing, there has been a more active demand, and, in the aggregate, there has been a fair volume of business. The new business in Soft Steel Bars has not been large, but more than most mills are desirous of seeing. Specifying on old contracts has continued liberally, and the market has remained strong at 1.75c. to 1.90c. Hoops have been slow and easy at 2.10c. to 2.25c., while Angles have been in good demand at 2.25c., base, mill shipment. From store the demand for all kinds has been active. Bar Iron is selling at 2.25c., Soft Steel Bars at 2c. to 2.25c., Angles at 2.50c., and Hoops at 2.50c., base, from store.

Structural Material.—The demand continues very active for both present and later deliveries, but it is almost impossible to obtain any Steel in appreciable quantities for delivery during the current year, nearly the entire business booked being for 1903. Between 5000 and 6000 tons have been taken, in small amounts, and there are one or two large contracts still pending. It has developed that the Burlington road, being unable to obtain the deliveries wanted for bridge work, have modified their order, it being determined to place their contracts in smaller amounts; but even so there seems to be much difficulty in obtaining the deliveries required. The city of Chicago is in the market for another bascule bridge to be used at Harrison street. This structure will take about 800 tons of Steel. About 500 tons of foreign Beams and Angles have been sold at the rate of 2.15c., Chicago, for shipment from Germany in August. Domestic Steel, mill shipment, is quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c. The urgent demand for all kinds of Structural Material from store continues, and in most instances liberal premiums are demanded and obtained readily. Beams and Channels from local yards are quotable at 2.50c. to 3.50c., Angles at 2.50c. to 3.50c., Tees at 2.55c. to 3.50c., but premiums are often paid over these prices for special sizes wanted immediately.

Plates.—The demand has continued very active, and the market is very strong, with the mills even further sold ahead than ever, and a premium of $4 to $5 per ton readily paid for early delivery when obtainable. Contracts for six more lake steamers have been placed during the week, and three or four of them at least have not yet, perhaps, been covered by contracts for Plates, but the orders have not yet appeared in the market. Official quotations remain as follows: Tank Steel, ¼-inch and heavier, 1.75c. to 2.25c.; Flange, 1.85c. to 2.35c.; Marine, 1.95c. to 2.50c. The demand from store is as urgent as ever, and the market very strong. Prices are, however, unchanged, as follows: Tank Steel, ¼-inch and heavier, 2.30c. to 2.50c.; Tank Steel, No. 8, 2.45c. to 2.55c.; Flange, 2.40c. to 2.75c., all f.o.b. warehouse, Chicago

Sheets.—The demand for Heavy Sheets has continued on a liberal scale, and the market is very strong. Even Light Sheets have been less pressed for sale, and Galvanized Sheets have been quiet without essential change in prices. Quotations are as follows: No. 27, Black Sheets, 3.15c. to 3.25c., Chicago, for mill shipment, while small lots from store are quotable at 3.45c. to 3.55c. Galvanized Sheets, mill shipment, are sold at 4.45c. to 4.50c., with discounts still allowed in some cases. Small lots from store are held at 4.70c. to 4.75c. for No. 27.

Cast Pipe.—A strong and confident tone continues without further change in prices. The demand from railroads, gas and water companies has continued fair, and one or two large contracts have been placed by municipalities, one for 2000 tons of 4 to 12 inches having been taken for shipment to Indian Territory. One contract for 10,000 tons of 24-inch Pipe, taken for Southern shipment, has just been made public, the order having been placed in the East. Manufacturers quote Cast Iron Water Pipe as follows: 4-inch, $35.75; 6-inch, $33.75; 8-inch and upward, $33; Gas Pipe, $1 per ton higher than Water, f.o.b. Chicago.

Boiler Tubes.—Business has been without special activity or feature, and prices have remained steady. For mill shipment prices are as follows:

	Steel.	Iron.
1 to 1½ inches	42½	39
1¾ to 2½ inches	55½	38
2¾ to 5 inches	61	48
6 inches and larger	55½	38

The demand from store has been moderate, and the market has continued steady as follows:

1 to 1½ inches	35	35
1¾ to 2½ inches	47½	32½
2¾ to 5 inches	55	42½
6 inches and larger	47½	..

Merchant Steel.—A more active demand for Machinery Spring, Agricultural, Tire and Open Hearth Spring Steel has been experienced. Some liberal contracts for long delivery has been placed for Agricultural Steel, and from 100 to 500 ton lots have been placed for Spring and Tire Steel by carriage manufacturers. Mill shipments are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.65c. to 2.75c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe,

1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 50 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 6½c. to 7c. for mill shipments; specials, 12c. upward.

Rail and Track Supplies.—The bookings by Western mills have been so heavy that it is almost impossible to place any orders of magnitude for delivery earlier than the middle of October. This fact is delaying business here, one lot of 100,000 tons offered by a syndicate being still held in abeyance. There have been sales of two lots, one of 7000 and the other of 17,000 tons, of Heavy Sections for fall delivery. Several other orders, one of 25,000 and one of 50,000 tons, are being negotiated. Nearly all of this business will necessarily be placed in the East for next summer's delivery, but buyers are indisposed to close because of the additional freight rates necessary. The official prices for Heavy Section Standard, of course, continue, $28, second quality selling at $27 at the mill; Light Sections are in good demand, and whatever is offered sells readily at prices ranging from $32 to $40 per ton, according to weight and time of delivery. Track Supplies have continued very active, both for nearby and future delivery; but it is almost impossible to obtain anything for nearby shipment. Fastenings are quoted in carload los: Splice Bars or Angle Bars, 2c.; Spikes, 2.50c.; Track Bolts, with Hexagon Nuts, 3.10c. to 3.45c.; Square Nuts, 2.95c. to 3.10c.

Billets.—There has been a fair inquiry for both foreign and domestic Billets, with somewhat of an improved tone during the past few days. Foreign sellers are less urgent, and resales are less frequent. Open Hearth Foreign Billets are held at $31.50 to $32; Bessemer Billets at $31 to $31.50, with sales of 2000 tons at $31.50 for August shipment. Domestic Open Hearth Billets are selling to a moderate extent at $35 to $40, according to analysis, buyer and time of delivery.

Old Material.—A very strong tone has characterized the market, resulting from the continued active demand and light offerings; higher prices have been obtained for Turnings and Borings, but other kinds have been without essential change. The following are the prices current per gross ton:

Old Iron Rails	$24.50 to $25.00
Old Steel Rails, mixed lengths	18.50 to 19.50
Old Steel Rails, long lengths	23.50 to 24.50
Heavy Relaying Rails	32.00 to 33.00
Old Car Wheels	21.00 to 22.00
Heavy Melting Steel Scrap	19.00 to 19.50
Mixed Steel	15.50 to 16.00

The following quotations are per net ton:

Iron Fish Plates	$22.50 to $23.00
Iron Car Axles	25.00 to 26.00
Steel Car Axles	23.00 to 23.50
No. 1 Railroad Wrought	21.00 to 21.50
No. 2 Railroad Wrought	18.50 to 19.00
Shafting	19.00 to 20.00
No. 1 Dealers' Forge	16.50 to 17.00
No. 1 Busheling and Wrought Pipe	14.50 to 15.00
Iron Axle Turnings	14.50 to 15.00
Soft Steel Axle Turnings	14.00 to 14.50
Machine Shop Turnings	14.00 to 14.25
Cast Borings	10.00 to 10.25
Mixed Borings, &c	9.50 to 10.25
No. 1 Boilers, cut	14.50 to 15.00
Heavy Cast Scrap	15.00 to 15.50
Stove Plate and Light Cast Scrap	11.50 to 11.75
Railroad Malleable	16.25 to 16.75
Agricultural Malleable	.... to 15.00

Metals.—There has been little if any improvement in the demand for Copper, and the market has remained steady, Lake selling at 12⅛c. in carload lots and at 12½c. to 12¾c. in a jobbing way. Pig Lead has met with a fair demand and a firm market at 4.05c. for Desilverized in 50-ton lots and 4½c. in carload lots. Sheet Zinc has remained strong, with a good demand at 6½c. in carload lots, and 6.65c. in lots of 600 lbs. Old Metals have remained quite easy, without change in prices, which are as follows: Heavy Cut Copper, 11¼c.; Red Brass, 11¼c.; Copper Bottoms, 10c.; Lead Pipe, 3.80c.; Zinc, 3½c.

Coke.—The market has continued stringent, the current receipts not provided for on contract being readily sold at full prices, Connellsville 72-hour Foundry Coke, as well as West Virginia and Virginia, being quotable at $6 on track, Chicago.

Philadelphia.

FORREST BUILDING, July 29, 1902.

The market looks more like breaking away from its environments than at any time during the past three months. Practically there is no change in prices and no deterioration in the business outlook, but prices at high pressure are becoming wearisome. The difficulty in securing full supplies of American Pig Iron is unabated, but the continuous and increasing arrivals of foreign material are allaying anxiety as regards fears of actual famine conditions. Moreover, the strike in the coal districts, after continuing three months, is pretty sure to be broken soon, and while there are differences of opinion as to the actual time, it cannot under any circumstances run another three months. The general opinion is that by the middle of August the men will be at work, but whether they are or not, its worst effects have been felt, and a week or two more or less will not make much difference either way. It has set people thinking, however, in regard to its probable influence on Pig Iron, and has also developed a more conservative feeling in regard to long deliveries, but, as we said before, actual changes in prices are not yet in evidence. Steel is easier, but strange to say it is not run after nearly as much as it was when prices were $2 to $3 per ton higher, although there appears to be no falling off in consumption. In the more advanced products the feeling is moderately confident, although there is not the rush to place orders that there was during the eary spring months. Perhaps a fair statement would be that the entire trade is in excellent shape, but, with that, there is a disposition to avoid overconfidence and to wait further developments before assuming renewed aggressiveness.

Pig Iron.—It is difficult to find any difference in the conditions as they are to-day and as they were a week ago. In some cases sellers seem inclined to talk stronger markets, but this frequently indicates that they have more Iron for sale. When there was a genuine scarcity and good buying the greatest bears were those who sold too soon, and it is not altogether improbable that the turn of the scale is now in the other direction; not that there is any pressure to sell Iron, but propositions to purchase large lots are not usually turned down if deliveries are to be pretty well extended. As a matter of fact the market is extremely sensitive. Buyers have become so accustomed to being turned down that they are, comparatively speaking, "rather easy," and, on the other hand, sellers have become so used to being despotic that they still rule with rather a strong hand. When these characteristics are eliminated "business will be business," and it is just possible that that feature will be more of a factor in the near future than it has been during the past six months. Naturally there has been more or less favoritism during the extreme scarcity, and it is proper that there should be. If a seller fails to stand by his customer in time of need the customer is not likely to overlook the fact in times of plenty and an open market; and if that point has not been reached yet, it is only a question of time when it will be reached, and indications are not wanting that both sides are getting ready for it. As regards the immediate situation, it may be said that there is enough Iron to go around, but the difficulty is to find the kind required. Furnaces are working badly, and are turning out a good deal of White and Mottled Iron, but not enough of the Foundry grades, consequently these command better prices than they would if the furnaces were supplied with their usual fuel. Neither are imported Irons precisely what are wanted, being in many cases too high in silicon and too high in phosphorus. They can be used, and the price looks low, but a good proportion of stronger Irons is required to make a satisfactory mixture, and for such prices are as high as ever, and are likely to remain so until furnaces can get back to normal conditions. It will be seen, therefore, that prices are naturally very irregular, although the range is not materially different from last week—viz., for city or nearby deliveries during the last quarter of this year and the first half of next year (with a premium of 50c. to $1 per ton on August and September shipments):

No. 1 X Foundry		$23.50 to $24.50
No. 2 X Foundry		22.00 to 22.50
No. 2 Plain		21.00 to 22.00
Standard Gray Forge		20.50 to 21.00
Basic		20.50 to 21.00
Low Phosphorus	Prompt shipments or spot.	23.00 to 23.50
No. 3 Middlesboro		21.00 to 22.00
Scotch Irons		22.50 to 23.50

Billets.—Prices are easier, but the demand is chiefly for small lots for immediate shipment. Prices are more or less nominal, as much depends on the class of material required and on the time for delivery. American Steel would be about $32 to $33 for Bessemer, and $34 to $35 for Open Hearth. German Steel, $28.75 to $29.50, ex-ship, duty paid.

Muck Bars.—Sales this week at $36.50, which is a trifle less than previous sales. About $36 to $37, delivered to nearby mills would be pretty close to the market at this writing.

Plates.—The demand is well maintained and prospects for continued activity are exceedingly favorable. Mills are employed to the full limit of their capacity and prices are firm at the full figures recently quoted—viz: Small lots, 2.10c. to 2.15c. Carload lots and upward: ¼-inch and thicker, 2c. to 2.05c.; Universals, 2c. to 2.05c.; Flange, 2.10c. to 2.20c.; Fire Box, 2.25c. to 2.30c.; Marine, 2.30c. to 2.35c.; Charcoal Plates, C. H. No. 1, 2½c.; C. H. No. 1 Flange, 3c.; C. H. No. 1 Flange Fire Box, 3½c.

Bars.—Business is entirely satisfactory as far as regards demand, but prices are too low considering the high cost of production. Steel Bars are somewhat sharp competitors, however, as they are being sold at 1.60c., Pittsburgh, but with no guarantee for delivery except that it will be as soon as possible after September. Local mills are getting about 2.10c. for prompt shipments, however, so that there is in most cases a difference of $7 or $8 per ton between guaranteed prompt deliveries and open orders. Refined Iron Bars bring 1.95c. to 2c. for carload lots and upward for city or nearby deliveries.

Structural Material.—Prices are very irregular and depend entirely on the character of the order and time for delivery. Mill specifications for prompt shipments are 2.75c. to 3c.; lots from store or foreign, ex-ship, 2.25c. to 2.50c. These prices are for carload lots and upward of Beams, Channels, Angles, &c.

Sheets.—The demand for Thin Sheets is disappointing, but there is a good run of orders for all the numbers up to 17, on which prices are well maintained, but the high numbers are a little irregular, with nominal quotations about as follows: Best Sheets quoted about as follows (Common Sheets one to two-tenths less): Nos. 10 and 12, 2.30c. to 2.40c.; No. 14, 2.50c.; Nos. 16 and 17, 2.70c.; Nos. 18-21, 3c.; Nos. 26, 27, 3.20c.; No. 28, 3.40c.

Old Material.—Prices are very hard to quote, material that happens to be wanted brings full prices, but otherwise it is difficult to move anything without accepting inside figures. Bids and offers are about as follows, for deliveries in buyers' yards:

Old Steel Rails	$21.25 to $21.75
Heavy Steel Scrap	21.00 to 21.50
Low Phosphorus Scrap	27.50 to 29.00
Old Steel Axles	27.50 to 28.50
Old Iron Rails	24.50 to 25.50
Old Iron Axles	29.00 to 30.00
Old Car Wheels	21.00 to 21.50
Choice Scrap, R. R. No. 1 Wrought	23.00 to 24.00
Country Scrap	18.50 to 19.50
Machinery Cast	17.75 to 18.75
No. 2 Light Scrap	18.00 to 19.00
No. 2 Light Scrap (Ordinary)	15.00 to 16.00
Wrought Turnings	16.50 to 17.50
Wrought Turnings, Choice Heavy	18.50 to 19.00
Cast Borings	10.50 to 11.00

Cleveland.

CLEVELAND, OHIO, July 29, 1902.

Iron Ore.—The car shortage has been considerable, but the shippers have continued to load all boats which presented themselves at the head of the lakes. As these have been coming down in a regular procession, and as those already at the docks have been unable to unload, the natural consequence has been a congestion at the unloading ports that has come to be serious.

Pig Iron.—The hesitancy about buying Pig Iron for future delivery seems to have disappeared. Some of those who were holding back have now come upon the market and are buying for the first and second quarter delivery of next year very freely; some sales also include deliveries into the third quarter. On this business the prices of the Foundry grades do not change from previous quotations, No. 2 bringing from $21 to $21.50 in the Valley. There is no disposition to demand a higher price and many of the consumers have estimated that the material can be profitably used on that basis. Any further advance would, it is conceded, bring Pig Iron into the questionable zone, and in all probability reduce the demand for it. The supply of Iron for immediate delivery is reduced to the minimum. Occasionally a small lot of a carload or so makes its appearance on the market and is caught up at once at normal prices, almost all such sales being made at between $24 and $25 at the furnace. It is quite apparent now that Iron will be more scarce before any relief comes to the consumers. This statement is based on the very evident tendency in the Coke supply. Most of the furnaces in the Valleys have been running hand to mouth for the past two or three weeks, and the fuel supply seems to become more scarce rather than to improve. In Basic Iron the trade has started in well for next year. The new basis of prices has just been agreed upon and activity is becoming quite general. About all of the product has been sold up for the first quarter of next year and sales are rapidly taking up the supply for the second quarter also. Basic prices now rule at about $20 at the furnace. There is very little or no Basic for sale for immediate shipment. Occasionally some off Basic is sold at $20.50, Valley furnace, and is taken up very eagerly by consumers. There was a single transaction in Bessemer Pig Iron during the week. It involved a trade of several grades of material to bring out the amount of Bessemer Pig that was needed and was about on the basis of $24.50. This was practically for quick shipment, as it will be delivered inside of the next four months. It is only by such maneuvers that any material is brought out for immediate delivery. Some of the furnaces not included in the Bessemer Association have sold a great deal of material for delivery during the second and some even for the third quarter of next year, but the furnaces in this territory have made no such sales. The furnaces here are still making no quotations for future delivery.

Finished Material.—There is still every sign of continued prosperity in the Finished Steel trade at least well on into next year, and the pace that it has struck now seems to indicate some anxiety on the part of the consumers lest they be left without needed material. An almost unprecedented thing occurred this week. One of the big consumers of Structural Steel recently placed an order for 6000 tons for delivery during the first quarter of next year, and this week followed that up with specifications as to sizes and deliveries for the entire amount. Other users of Structural Material have also done the same thing, and it begins to look now as if not only the material would be sold up, but that all of it would be specified, thus doubly clinching the bargain. One ship order taken this week covered 1000 tons. In addition, the selling of Structural Material for future delivery has continued until all of the material for the first quarter delivery, most of it for the second quarter delivery and some of the third quarter capacity has been sold. The price has held steadily at 1.60c., Pittsburgh. There is a strong call for immediate shipment, and mills having any material of which to make such disposition are getting 2¼c. to 2¾c. at the mill. Stock prices are holding at 2½c. to 3c. On Plates the immediate demand is quite large and the supply is correspondingly short. The mills which are selling small quantities are still asking 2c at the mill, but even at that price the selling is not very heavy. The sales for future delivery have continued, and now it is a question to be able to get any material delivered before April 1. In the intermediate sizes between Plates and Sheets the demand continues very heavy and the supply is short. Those having material could get about their own prices. The Sheet trade holds up well, despite the frequent appearance of the report that the smaller producers are bidding under the market. It seems, indeed, as if the market has been underbid in some respects, and that some of the smaller mills have carried away a good deal of tonnage, but this has not affected the market at large. The prices, therefore, hold as they have been quoted heretofore at 2.50c. for No. 10 as a basis on the gauges between 10 and 16, and 3.50c. to 3.60c. on No. 27 as a basis on the gauges between 17 and 28. The Agricultural Implement makers have been on the market this week making inquiries for material for next year, and seem to be very anxious to close. They demand mostly Bars and Plates. One buyer closed for 1000 tons of material. In most instances the sales of Bars have included only the Steel product, as Bar Iron seems to have been about ruled off of the market by the high prices demanded a short time ago. The price asked for Scrap, of which Bar Iron is made, has been about prohibitory, and those who have had a choice have turned their attention to the sale and production of Bar Steel. The other mills, however, which have continued to make Bar Iron have been looking for business, and finding the market unwilling to pay a large premium are now offering to sell under the market quotation of 1.80c., Pittsburgh. Some few contracts have been closed on that basis. The sales of Rails have continued during the past few days, but the activity is not as great now as it has been since most of the big railroads have bought their supply. There is a very active demand for Light Rails, and the price is still soaring about $38 to $40.

Old Material.—The demand for Scrap this week has not kept pace with that for other material, and the evidences are that the dealers are asking more than the consumers are willing to pay. The market holds steady at the following prices: No. 1 Wrought, $19.50, net; Iron Rails, $27.50, gross; Iron Axles, $26, gross; Cast Borings, $10, gross; Wrought Turnings, $15.25, gross; Cast Scrap, $16, net; Car Wheels, $19, gross; Heavy Melting Steel, $19, gross; Old Steel Rails, $20, gross.

St. Louis.

CHEMICAL BUILDING, July 30, 1902.—(*By Telegraph.*)

Pig Iron.—In so far as new inquiry and demand for Pig Iron is concerned, these are quiet days. The bulk of the demand continues to come from parties whose requirements are covered in contracts, but on account of delayed delivery are compelled to pick up odd offerings in the open market. The furnaces seem to be very careful and conservative in booking orders for 1903 delivery and few orders are accepted by sales agents before first being submitted to the furnace managers. The following is the range of prices current for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$20.50 to $23.50
Southern, No. 2 Foundry	20.75 to 22.75
Southern, No. 3 Foundry	20.25 to 22.25
Southern, No. 4 Foundry	19.75 to 21.75
No. 1 Soft	21.25 to 23.25
No. 2 Soft	20.75 to 22.75
Gray Forge	19.75 to 21.75

Bars.—The jobbing trade at this time is not meeting with a heavy call for Iron and Steel Bars, but the reports from the mills indicate very busy conditions to fulfill requirements on the order books. We quote from the mills Iron Bars at 1.90c.; Steel Bars at 1.90c. to 2c. Jobbers quote Iron Bars at 2.25c.; Steel Bars at 2.25c., full extras.

Rails and Track Supplies.—Very busy conditions continue to be reported from this department of the market, and the requirements entered for 1903 at this early date are said to be of large proportions. We quote Splice Bars at 2.10c. to 2.15c.; Bolts, Square Nuts, 3c. to 3.10c.; with Hexagon Nuts, 3.25c. to 3.30c.; Spikes, 2.50c. to 2.60c.

Angles and Channels.—The demand from the jobbers for Small Angles and Channels is light, but the trade enter-

tain very hopeful views for future market conditions for materials of this class; 2.50c., base, is the quotation.

Sheets.—Trade in the market for all grades and sizes of Sheets is on a basis satisfactory to the jobbing interests.

Lead.—Firm conditions rule in Lead market and the quantity and quality of the demand show improvement. Chemical at 3.97½c. to 4c., and Desilverized at 4.05c.

Spelter.—After a slight recession the past week the Spelter market has strengthened and the heavy demand continues. Spot metal is very scarce and brings higher prices. Futures are quoted at 5.05c. to 5.10c., and the feeling in the trade seems to presage higher prices.

Birmingham.

BIRMINGHAM, ALA., July 28, 1902.

The conditions of the Iron market, as reported last week, are practically unchanged. The demand is just as great, and the supply is no greater than has been previously stated. What little is obtainable is snapped up with avidity. In fact, the buyers are on the alert all the time for any lot that can be had, and they are about as well posted concerning the various outputs of the furnaces as the managers. For every lot that can be had each buyer has specious reasons for priority of claim. No one is getting any except in very moderate size lots. No seller of iron has it in any other way. If he did there would be no trouble to find a place for all he had. As before represented in these letters, the buyers include big fish and little fish. All want it, and there is comparatively little trouble in arranging the price, though it be a very varying one. For spot and nearby delivery sales have been made at $20, $20.50 and $21 for No. 2 Foundry. Some White Iron sold at $18.50. Some No. 1 Soft sold at $22.50. It is hard to quote Gray Forge, as there is practically none offering. Some of it went lately to a large Pipe plant, but the terms of sale have been well guarded. Some No. 2 Foundry and some No. 3 Foundry were sold at $19 and $18.50 for November and December, and there have been sales at even higher figures. In frequent cases their insignificance in volume is a bar to their publication. There is no effort whatever to maintain any uniformity in price, and each seller is indifferent concerning the price his neighbor obtains. The market is a "go as you please" one. There is a disposition to protect regular customers as far as possible, and in many cases their applications are in advance of their necessities. Some of our local plants who trusted to an easing up of the situation have been caught bare of supplies and have had to shut down until they could, by hook and by crook, obtain sufficient to keep going. Begging and borrowing, based on promises that they will be protected as far as possible, is a common thing. In short, the scarcity of iron is felt just as keenly here as at any other point. Proximity to supply gives no special advantage now.

Interest in the market is centering in 1903 deliveries. Under normal conditions the forward deliveries would command a premium over spot delivery, at least sufficient to cover carrying charges. As it is, the forward delivery price is at a discount under cash and nearby delivery. This would indicate that spot Iron was too high, and that a weakening of the market was sure to result, or that forward delivery Iron was too low and had to advance. One or the other must happen. It looks just now as if prices for 1903 must advance, because of the demand for that delivery. From the time the order books were opened for 1903 business there has been a good booking for that delivery. It is a very conservative estimate to place the registered business for the first half of 1903 at 150,000 tons. Of this amount two interests have sold at least 100,000 tons. Your correspondent is fully satisfied that 175,000 tons is no exaggeration of this business. Should the demand continue, the inevitable result will follow and a further advance be scored. In all sales for 1903 the buyer must take the chances on the freight rate. The trade here expects an advance in freight rates by January 1, and are taking no chances on the continuance of present rate.

There has been a slow and gradual increase in the furnace output, but it will be some time before we reach our maximum capacity. Stocks continue to be "nil," and a good deal of Iron is loaded from the cast bed into the cars. What goes into the yards is against sales already made, as a rule, and there is very little at the disposition of fresh business.

With a few exceptions the mining fraternity have returned to work. There are some minor matters yet to be arranged at a few camps before work is resumed. They will give no trouble.

The location of the Shuler furnaces has not yet been announced, but there is an impression that the decision is narrowed down to either Bessemer or North Birmingham. Negotiations are pending for the starting of another furnace now out of commission. But they have not yet reached a point that will justify any definite announcement.

There was an important transfer of Coal interests the past week by which the Milner interests at New Castle mines become the property of the Anniston Furnace interests. The terms of the sale are withheld for the present. It is current rumor that the Executive Committee of the Tennessee Company has confirmed the sale of the Oxmoor furnaces, and that the price paid was $87,000. The new owners will lose no time in putting the property in working condition.

The small strikes, of which mention has been made, have about petered out. They are things of the past. Everything at the moment is full of encouragement for a period of activity and prosperity the remainder of this year.

The shops that make a specialty of heavy work are full of orders, and some of the best customers they have are from Mexico and the West Indies. The home demand for all kinds of work continues to be fine, and there is no complaint on that score. It has not infrequently happened that orders were declined from sheer inability to complete them within a reasonable time.

The lack of labor in several lines is a restriction on business, and this can be remedied only by degrees. We are gradually inducing it here from other districts. There are some important deals in process of negotiation, but they are slow coming to conclusions, and the progress made is carefully withheld from publicity.

Pittsburgh.

(By Telegraph.)

PARK BUILDING, July 30, 1902.

Pig Iron.—One of the leading Steel companies, said to be the Republic Iron & Steel Company, have made contracts in the past week or so for a very large tonnage of Bessemer Iron, much of it for delivery and running all through next year. One contract was for 30,000 tons, 2500 tons a month for all of next year at $18, at maker's furnaces. In all, it is reported that this company have made contracts for about 100,000 tons of Bessemer Iron. They are considerably enlarging their Bessemer Steel Works, and will not be able to make enough Iron at their furnaces to supply their own requirements of metal, and this accounts for the fact that they are buying so heavily of Bessemer Iron in the open market. The price of $18 at furnace for shipments through all of next year is regarded as a very fair one for both buyer and seller. It is a low price for the first quarter of the year, but the price of Iron may be under $18 before next year has come to an end. Aside from the above there have been no heavy sales of Bessemer Iron, nor are there any large inquiries in the market. Bessemer Metal for shipment this side of January is $20.75 to $21 minimum at furnace. Further sales of Basic Metal for next year are reported at a price equal to about $20, at maker's furnace. There have been heavy sales of No. 2 Foundry Iron for shipment through the first quarter and the first half of next year at $21.50, Pittsburgh. The Southern furnaces which now have a pooling arrangement have fixed the price of No. 2 Foundry at $17, Birmingham, which, with an all-rail freight to Pittsburgh of $4.15, makes the price of Southern No. 2 Foundry $21.15, delivered here. However, Northern brands of Foundry usually command a little higher price in this market than Southern Iron. No. 2 Foundry for shipment this side of January is $22 to $22.50, while Forge Iron for shipment within three to four months is $21 to $25, Pittsburgh.

Steel.—A slightly better inquiry for Steel is reported, but the market is soft, and it is predicted that prices will be lower toward the close of the year than they are now. A large amount of Open Hearth capacity will soon be ready, and this Steel will have to find a market. One of the leading Steel companies are reported to have entered the market recently as a seller, which will ease the situation somewhat as regards supply. Foreign Billets can be laid down in Pittsburgh at $31, or under, and Sheet Bars at $31.50 to $32. Domestic Billets are held at about $32 and Sheet Bars at about $33. Some consumers claim to have been offered domestic Steel at lower prices than these.

(By Mail.)

There is quite a heavy buying movement in Pig Iron for shipment next year, the Republic Iron & Steel Company having bought several large lots, including one of 30,000 tons, deliveries in some cases running over all of 1903. The Republic Company are making large additions to their Bessemer plant at Youngstown, which will very much increase its capacity, and they will not be able to make enough Pig Iron to supply it at their four blast furnaces, two of which are at Youngstown, one at New Castle and one at Sharon, and this is why they are buying so heavily of Pig Iron in the open market. There have also been very heavy sales of No. 2 Foundry Iron for delivery in the first six months of next year, and at very good prices. With the large tonnage in Pig Iron that is already sold, together with the fact that there will not be any increase in productive capacity for some months, it seems certain that present prices of Pig Iron will be maintained through the first half of 1903 at least. Furnaces in the Valleys and elsewhere are still having a good deal of trouble in getting Coke, and many of the furnaces are not getting out more than half their usual output and some of them much less. It is not likely the present situation, as regards the supply of Pig Iron, will be relieved for some time. The Steel market continues quiet, but it is said that one of the large Steel makers has recently

appeared as a seller for the purpose of shutting off importations of Foreign Steel, and if this is true it is not likely much more if any Steel will be brought over from the other side. The situation in Finished Iron and Steel is unchanged. There is a continued heavy demand for Plates, Bars and Structural Material, but other lines, such as Sheets, Tin Plate and Wire products, are quiet, with prices inclined to weakness.

Muck Bar.—We note a sale of 3000 tons of Muck Bar at $36, Pittsburgh, and the market may be fairly quoted at $36 to $36.25, f.o.b. cars Pittsburgh, for Standard grades of Bar. We may note, however, that Eastern brands of Muck Bar are being offered at about $35, delivered in this market.

Spelter.—Prices are steadily advancing, and prompt Spelter is 5.60c., Pittsburgh, to-day, with all indications favoring still higher figures. Spelter is scarce, and prompt deliveries are hard to obtain.

Steel Rails.—Large tonnage is pending, and will likely be placed within a week or two. We quote at $28, at mill, for Standard Sections, and note that Light Rails are bringing very high prices, owing to their scarcity.

Rods.—Two or three of the largest Rod mills in the country are closed for repairs and improvements, and will not be started up for some time. Demand is somewhat quiet, but Rods for prompt shipment are reported scarce, and Bessemer bring about $36 and Open Hearth $38, at mill.

Plates.—The situation is more aggravated as regards deliveries, and two of the local mills are sold up solid for the rest of this year. Quotations are still on the basis of 1.60c., but for next year delivery. An Eastern mill is reported to have captured a contract for Plates for three large boats, which will take a heavy tonnage. Mills that can ship out Plates within four to eight weeks after receipt of order can get from 1.75c. to 1.85c. for them. There is no change in official prices, which are as follows: Tank Plate, ¼ inch thick and up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

Bars.—There is a moderate amount of new tonnage being placed in Bars, and specifications on old contracts are coming in very liberally. There is some talk of fixing up a selling agency of some kind among mills rolling Iron Bars. Two or three of the leading Bar mills here report they are sold up to October, and one mill well into next year. We quote Steel Bars at 1.60c., half extras, for carload and larger lots, while small lots bring 1.70c. to 1.75c. All specifications for less than 2000 lbs. of a size are subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10c. per lb. extra. Quantities less than 1000 lbs., 0.30c. per lb. extra, the total weight of a size to determine the extra, regardless of length. We quote Iron Bars at 1.80c. in carloads and 1.90c. in small lots, f.o.b. Pittsburgh, extras as per National card.

Hoops and Bands.—A fair amount of business is being placed, but a larger tonnage could be taken care of, if it could be had. We quote Hoops at 1.90c. for 250-ton lots and over and 2c. in carloads. Bands are 1.60c. for Bessemer stock, 12-gauge and heavier, while for Open Hearth stock $2 per ton advance is charged.

Sheets.—We note a continued heavy demand for the heavier gauges of Sheets, but the lighter gauges are quiet, and the tone of the market is weak. Prices on Galvanized are weaker than on Black, and some low figures on the former are being made. It is claimed that Sheet mills that do not have their own supply of Steel, and have to pay market prices for Sheet Bars and Spelter, cannot sell Galvanized Sheets at present prices and make a profit. We quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.90c., and No. 28 at 3c. in carload lots. Jobbers charge 3c. to 3.15c. for No. 27 in small lots, and 3.10c. to 3.25c. for No. 28. Some of the mills now quote Galvanized Sheets at net prices, which has been the policy of the leading Sheet interest for some time. Some of the larger jobbers are also selling Galvanized at net prices, and in carloads charge about as follows: No. 24, 3.70c.; No. 26, 4c.; No. 27, 4.25c.; No. 28, 4.50c. Prices to jobbers in very large lots are somewhat lower than these. Mills that still sell on a percentage basis quote Galvanized at about 75 per cent. off in carloads. Small lots of Galvanized are 70 and 10 to 70 and 5 off. These prices are f.o.b. at mill.

Merchant Steel.—There is a good demand for Spring and Tire Steel, and also for Tool Steel, but some low prices on the latter are being made. We quote Tire at 2.15c. to 2.25c.; Sleigh Shoe, 2.15c. to 2.25c.; Spring Steel, 2.20c. to 2.30c., and Toe Calk, 2.25c. to 2.35c.; Cold Rolled Shafting is 47 per cent. off in carloads and 42 per cent. off in less than carloads, delivered in base territory. Tool Steel is 6½c. to 8c. for ordinary grades, and 12c. and upward for special grades. These prices are f.o.b. at mill.

Skelp.—The market continues quiet, and there is little inquiry. Prices of Skelp are fairly strong, owing to high cost of material from which it is rolled. We quote Grooved Iron Skelp at 2.10c. to 2.15c., and Sheared at 2.15c. to 2.20c; Grooved Steel Skelp is 2.15c. for large lots and desirable sizes to roll. These prices are f.o.b. at mill, terms 30 days, less 2 per cent. for cash. It is said a good deal of Eastern Skelp is being offered in this market at prices slightly lower than the above.

Merchant Pipe.—The Pipe mills are all pretty comfortably filled, and none of them seemed to be actively seeking orders. A fair amount of new tonnage is being placed, and the tone of the market is firm. Discounts in carloads are as follows:

Merchant Pipe.	Black.	Galvd.
⅛ to ½ inch, inclusive	60	48
¾ to 12 inch, inclusive	67	55

Coke.—It is said that fully 100,000 tons more Coke than is being made could be used if the ovens could turn it out. There is still a shortage in supply of Furnace Coke, and some of the Valley furnaces have been on the ragged edge for three or four weeks. It is likely the situation as regards supply will soon ease up, as there is more West Virginia Coke being shipped now than for some time. The *Courier* reports 20,611 ovens in the upper Connellsville region active last week, and only 814 idle, the output having been 249,559 tons. Shipments were 12,063 cars. The lower Connellsville region now contains 3269 ovens, of which 2999 are active and 270 idle. Shipments last week were 972 cars. From $3 to $3.50 and higher continues to be paid for prompt shipment of Furnace and Foundry Coke. Most large consumers are covered by contracts, made some time since at considerably lower prices.

Scrap.—It is understood that a good deal of foreign Scrap is being brought into this market. Demand for Scrap has been quiet for some time, but inquiries are a little better in the last few days. We quote No. 1 Railroad Wrought Scrap at $20 to $21, net ton. Cast Scrap is $19 to $19.50, net ton. Cast Iron Borings are $10.50 to $11, gross ton, and Heavy Melting Stock is $21 to $21.50, gross ton. There have been no sales of Old Iron Rails in this market for some time.

Cincinnati.

FIFTH AND MAIN STS., July 30, 1902.—(*By Telegraph.*)

After an unusually heavy week's business, next year's deliveries, the very important fact is developed that already quite a number of Southern furnaces are sold up for the first three months of 1903. Three or four furnaces, each one a considerable factor in itself in the general Southern trade, have telegraphed their agents here to withdraw entirely from the market until after March delivery, and that to understand that from now on all Iron sold for the second quarter must be on the basis of $17.50, Birmingham, for No. 2, this being an advance of 50c. over the association prices of a week ago and $1 higher than the minimum selling price of two weeks ago. Selling agencies here are expressing not a little curiosity as to whether there are any buyers who are actually overbought, the general opinion seeming to be that in place of being in that condition consumers acknowledge vacancy yet in their order books, and expect to fill out at some later date. The general situation points to this fact very plainly, that Iron will be Iron during at least the first half of next year, and there is no reason for believing that the present prices will not be maintained throughout the year. The situation for this year's delivery is just as it has been. Sellers who happen to have a few carloads of Foundry Iron have a dozen buyers in line in anticipation of the favor. Freight rate from Hanging Rock district is $1.10 and from Birmingham $2.75. We quote, f.o.b. Cincinnati, for 1902 delivery as follows, this year's delivery:

Southern Coke, No. 1	$21.25 to $22.25
Southern Coke, No. 2	20.75 to 21.75
Southern Coke, No. 3	20.25 to 21.25
Southern Coke, No. 4	19.75 to 20.75
Southern Coke, No. 1 Soft	21.25 to 22.25
Southern Coke, No. 2 Soft	20.75 to 21.75
Southern Coke, Gray Forge	19.75 to 20.75
Southern Coke, Mottled	19.75 to 20.75
Ohio Silvery, No. 1	25.85 to 26.10
Ohio Silvery, No. 2	25.35 to 25.85
Lake Superior Coke, No. 1	25.35 to 26.10
Lake Superior Coke, No. 2	25.10 to 25.60
Lake Superior Coke, No. 3	24.85 to 25.10
Car Wheels and Malleable Irons.	
Standard Southern Car Wheel, chilling grades	$27.00 to $27.50
Standard Southern Car Wheel, No. 2	26.50 to 27.00
Lake Superior Car Wheel and Malleable	25.00 to 26.00

Quotations for first six months of 1903, f.o.b. Cincinnati, on present freight rates, are as follows:

Southern Coke, No. 1	$20.75 to $21.25
Southern Coke, No. 2	20.25 to 20.75
Southern Coke, No. 3	19.75 to 20.25
Southern Coke, No. 4	19.25 to 19.75

Southern Coke, Gray Forge	19.25 to	19.75
Southern Coke, Mottled	19.25 to	19.75
Southern Coke, No. 1 Soft	20.75 to	21.25
Southern Coke, No. 2 Soft	20.25 to	20.75

These quotations are made and all contracts signed with the understanding that the buyer assumes any freight differential existing at that time.

Cleveland Machinery Market.

CLEVELAND, OHIO, July 28, 1902.

Cleveland machinery dealers and manufacturers say that the falling off in business which usually comes at this time of the year in consequence of warm weather and vacations is almost wholly lacking this year; only in the sale of supplies and small articles is it noticeable. Local dealers say there is a steady demand for machine tools, and although large orders are perhaps not quite as numerous as they were during the winter, the aggregate compares very favorably with the so-called banner months. Several dealers say July trade shows great improvement over the corresponding month for either last year or two years ago. The recent advance in the prices of many tools may have a temporary retarding effect on the demand, local dealers having increased drill presses and lathes 10 per cent., and other tools from 5 to 8 per cent. Your correspondent talked with one large manufacturer who has been figuring for some time on putting up a large factory, but has held off in the hope of lower prices on building material and tools. Recently he decided that something must be done to increase their facilities, and had about concluded to put up a new building and buy new tools when the recent advance on machinery caused him to throw up his hands again and decide to do the best he can with present facilities. For all that, there seems to be no abatement in the number of new building projects, and a review of the situation in this section shows that fully as many factories are putting up additions as at any time in the past year.

The Marshall & Huschart Machinery Company report that business continues to hold up better than during any summer in their experience in this city. The month of July is far in excess of the same month last year, and the business thus far this year is correspondingly ahead of the same period last year. Among other good orders they have recently sold a machine shop equipment of ten large tools to the Solvay Process Company, Detroit; also several large tools to the Wm. Tod Company, Youngstown.

A change has been made in the affairs of the Moore Pneumatic Crane Department of the Chicago Pneumatic Tool Company. Heretofore the business of this department has been conducted from the offices in this city, but in the future it will be carried on from the main office in Chicago under Charles Booth, manager of the company. The Cleveland factory is now in charge of John C. Gorten.

The Garry Iron & Steel Company are furnishing the structural material for four large buildings to be erected by the Atlanta Tin Plate Company, Atlanta, Ind., who are installing a rolling mill. They are building an extension for the Cleveland Steel Castings Company and are furnishing crane girders for a number of cranes being built by the Alliance Machine Company, Alliance, Ohio. At present they have on hand more orders for structural work than ever before. Many of their contracts are being held up through scarcity of material. In two cases they are just receiving material which was ordered last November, and in order to live up to certain contracts they are importing angles and beams from Scotland. They are also doing a very nice business in cranes for railway work.

G. H. Schuler of the Alabama Steel & Wire Company, Bessemer, Alabama, was in the city last week consulting with the Garrett-Cromwell Engineering Company relative to the equipment about to be purchased for their new machine shop and blooming mill which the Garrett-Cromwell people are designing. From Cleveland Mr. Schuler went to Pittsburgh, where certain purchases of equipment will be made.

The American Foundry & Machine Company, whose new plant at Ravenna, Ohio, has just been started, will erect a cleaning room addition to their foundry, 75 x 30, and a blacksmith shop, 30 x 36. They are starting out in their new plant with orders for over $60,000 worth of castings and mining machinery.

The Cleveland Crane & Car Company are making preparation to move into their new plant just completed, at Nottingham, a short distance outside the city. With the increased facilities afforded the company propose to go into the manufacture of cranes of the largest size. The present factory, located on the Pennsylvania tracks, in the best part of the manufacturing district, is being offered for sale.

The Cleveland Punch & Shear Works Company say that business is holding up surprisingly well throughout the summer months. They recently shipped a large multiple punch weighing over 30 tons to the Cambria Steel Company, Johnstown, Pa.

The recently organized Union Machine & Boiler Company have bought out the plant and business of the River Machine & Boiler Company, located on River street. Those interested are W. E. Perkins, J. G. Russell, M. B. and H. H. Johnson and G. Hogsett.

J. W. Kohn & Co., 71-73 Bolivar street, Cleveland, have been organized to deal in second hand machinery and complete manufacturing plants. Mr. Kohn was formerly a member of the Schneider-Kohn Machinery Company.

The Cleveland City Forge & Iron Company are making several large shafts for new vessels now being built in lake yards. They are also forging shafts for vessels being built by the Delaware Shipbuilding & Engine Company, Wilmington. They are at work on three large rudder frame stubbs for new battle ships, and have on hand a large amount of heavy work of various kinds.

George H. Bowler & Co., dealers in second-hand machinery, have opened a new warehouse at 59-61 South Water street, Cleveland, which they have stocked with a large number of heavy tools recently received from three plants which they have dismantled. They still retain their warehouse on Frankfort street, which is also well filled.

The National Acme Mfg. Company are now operating a portion of their enormous factory recently completed in this city. About 150 employees are at work, the majority of whom came from their former plant at Hartford, Conn. They are finding it difficult to secure the proper kind of help.

The C. O. Bartlett & Snow Company are moving into their new plant, which will vastly increase their facilities for the production of hoisting and conveying machinery and cement outfits.

The American Shipbuilding Company have taken an order for another steel steamer, which will be built for the Estate of Captain Mack and others. The vessel will be almost a duplicate of the steamer "William S. Mack," which was turned out last fall. She will be 374 feet keel, 48 feet beam, 28 feet deep. She will have triple expansion engines, and steam will be furnished by two Scotch boilers. The draft will be natural. This makes a total of 26 vessels under orders for 1903 delivery by the American Shipbuilding Company, sufficient to assure another very prosperous year in lake yards. The activity may not be as intense as during the past two years, during each of which there have been turned out 40 steel vessels, but, nevertheless, the business is immense. With the tonnage that is to come out of Canadian yards and with orders that will probably go to independent lake yards it begins to look as if the year might be fully as heavy as any previous one.

The Marion Steam Shovel Company, Marion, Ohio, report that they are having the heaviest business in the history of the company. At present they are employing between 500 and 600 hands; the largest force they ever had. They have all the machinery they can make up to November sold, and have orders that will take them until February 1 to fill.

The Perry-Payne Company are having plans prepared by W. R. Watterson for two immencse power blocks, to be erected in the business section of Cleveland. The buildings will cost about $250,000.

The Columbus Malleable & Gray Iron Company, Columbus, Ohio, whose plant was burned last fall, will be reorganized by Charles Kile, Harry Irvine and Walter Kile. The plant will be rebuilt at once, with twice the former capacity, plans having been completed.

The Union Machinery Company of Zanesville, Ohio, have been incorporated with $25,000 capital stock by William Haehnlen, Frederick Haehnlen, Benjamin Feil, Frederick Feaseley and Charles Meyer. They will succeed to the plant and business of the Blandy Machine Company of that city. The company will enlarge the plant and will manufacture new lines of machinery.

The Horton Mfg. Company of Painesville, Ohio, brick machinery manufacturers, are having plans prepared for a new plant to be located on the railroad, where they will have improved shipping facilities for heavy machines. The company had their annual meeting last week, and elected C. H. Horton, president and treasurer; W. P. Storrs, vice-president; George Steel, secretary. The above, with C. J. Scott and H. H. Bates, are directors. N. T. Breed has retired from the company.

Sealed bids will be received to August 18 by Clarence M. Addison, city clerk of Columbus, for furnishing material and equipment for the construction of the municipal electric lighting plant. The plans prepared by Perry Oakley call for three cross compound condensing engines, vertical or horizontal, of 500 horse-power, at 150 revolutions per minute; two condensers; three 400-kw. steam turbines and generators; four horizontal water tube boilers, 300 horse-power each, with straight tubes; one 176 x 9 feet self supporting steel stack; fuel economizers; three 500-kw., two-phase, alternating current generators, for direct connection to engines mentioned, and 1500 7.5 ampere series alternating inclosed arc lamps.

Much of the tube machinery from the Toledo tube plant of the Shelby Steel Tube Company is being shipped to the plant at Shelby, and it is reported that the Toledo plant is to be closed permanently. At present the annual output of the Shelby plant is 6,000,000 feet of seamless tube, but with the addition of the new equipment it will be increased great-

ly. It is stated that another rolling mill will be erected at Shelby.

The Phœnix Electric Company of Mansfield have taken a contract to build a 300-kw. generator for the Citizens' Electric Railway Light & Power Company of that city. The Phœnix Company recently succeeded the Card Electric Company, and they are working into heavier lines of electrical apparatus.

The City Council of Lima, Ohio, have decided to make an immediate purchase of one first grade and one second grade steam fire engines. The matter is in the hands of the Fire Purchasing Committee of the Council.

The Hayden-Corlett Chain Company, Columbus, have commenced work on their new building for the manufacture of all kinds of chain. The company have recently been organized by prominent Columbus people.

The Lake Erie Foundry Company, Cleveland, will erect an addition, 60 x 180 feet, adjoining their plant on Oxford street and the Lake Shore Railway tracks.

The Fostoria Heating Company, recently organized at Fostoria, Ohio, with $100,000 capital stock, will commence immediate work on the installation of a Yaryan heating system.

The Ohio Motor Company, Sandusky, manufacturers of gas engines, have closed a contract for the erection of a large addition to their plant. It will be of brick and steel, 36 x 193 feet. New machinery will be installed and the capacity of the plant will be doubled.

The Lincoln Stove Company of Toledo have broken ground for an addition which will more than double their capacity.

The New York Machinery Market.

NEW YORK, July 30, 1902.

General conditions remain unchanged. The ordinary machine tool and power plant supply trade is not marked by purchases of a spectacular nature, but small orders come in in good steady procession so that at the end of the month it is found that business has been good, even though devoid of "big deals." In heavier lines, such as heavy machine tools, large engines, &c., demand continues considerably ahead of production. We hear that the Niles-Bement-Pond Company have booked their shops so far ahead that it was found advisable to import a lot of heavy machine tools built by the German Niles concern. The shipment, we are advised, arrived in Boston. Builders of large engines are still booked far ahead.

It is stated in almost all quarters of the machine tool trade that the advance of prices has not affected demand in the slightest. Concerns who had inquiries out before the advances were made have not withdrawn them. The Babcock & Wilcox Company, for instance, had a fair sized inquiry out and received the lower quotations. A few days ago they received notices of advances and placed their orders at the higher figures. One lot of lathes which they purchased, we are told, cost them 20 per cent. more than the original quotation. There have been further advances in machine tools by parties who were not present at the meetings where concerted action was taken. Grinding machines have been advanced about 5 per cent. The Garvin Machine Company raised prices all around, averaging 5 per cent., on their own product. In all branches of the machine tool trade prices are now higher than they were a few weeks ago and purchasers have apparently accepted the new conditions cheerfully. A prominent machine tool merchant compared his present prices with those of ten years ago, and found that the recent advances brought them to just about the same position as they held at that time. During the ten years intervening the machines have been improved so that their efficiency is now 100 per cent. higher. This illustration was simply held to show that while machine tool builders have been constantly improving their product, they lacked the nerve to increase the price of their tools or even to maintain firm values. Machine tools have doubtlessly been very cheap for a long time.

There is considerably more activity in the purchasing of machinery for the Navy Department than has been displayed for some months past. This is largely due, and may be expected to continue, owing to the decision of the Secretary of the Navy to build certain ships at the navy yards. Bids were opened yesterday for a fair sized lot of machine tools for the Boston Navy Yard. The bids have not been tabulated as yet, however. The list of tools includes:

One double punch and shear, motor driven; 2 single punches or shears, motor driven; 1 open throat plate and bar shears; 1 52-inch upright drill press; 1 horizontal boring and milling machine; 1 plain milling machine; 1 shaper; 4 engine lathes; 1 pipe threading and cutting machine; 1 32-inch single plate planer; 1 50-inch swing engine lathe.

On August 12 the Bureau of Supplies and Accounts will open bids for a list of tools to be furnished the Puget Sound Navy Yard. The list includes:

One milling machine, No. 3; 1 20-inch shaper; 1 upright drill, 20-inch; 1 universal tool grinder; 1 polishing machine; 1 wet and dry tool grinder; 1 20-inch lathe; 1 radial drill; 1 turret lathe; 1 tool room lathe; 1 planer and matcher; 1 saw and dado machine; 1 band saw; 1 wood boring machine; 1 wood turning lathe; 3 induction motors; 2 transformers; 6 motors with an aggregate of 45 horse-power.

At the office of the Washington Aqueduct, 2728 Pennsylvania avenue, Washington, D. C., proposals for 2200 tons of cast iron pipe and specials, 120 sluice gates, 31 water valves, 27 venturi meters, 6 pressure controller valves and 120,000,000-gallon centrifugal pumping plant, will be received until August 12. A. M. Miller, lieutenant-colonel of engineers, is in charge of the work.

It is evident that the officials of the New York Navy Yard intend establishing a record in the construction of the battle ship "Connecticut," which is to be built at Brooklyn. It is expected to have the keel laid within nine months. Work toward this end has already been begun.

As with the other navy yards which are to build the war vessels recently decided upon, a special appropriation is allowed for fitting out the yard to cope with the work. The appropriation allowed the New York yard is $180,000. The use to which the bulk of this sum will be put has been decided upon. It will be spent in the purchase of a time and labor saving device, a "Brownhoist" cantilever shipbuilding crane. The order has just been placed with W. A. Stadelman, Eastern representative of the Brown Hoisting Machinery Company, whose offices are at 20 Cortlandt street. The contract is a most important one, not only because it involves something over $100,000, but as it will aid the Navy Department materially in establishing a record in speed and the economical construction of war vessels. The installation of a crane of this type will equip the New York Navy Yard so that it will be in a position to compete very favorably with the great shipyards in the matter of constructing war craft complete. Several cranes of this type are now in use at the Newport News, Cramps, Vickers Sons & Maxim and other prominent yards. The crane will be mounted on a "Brownhoist" special design of trestle, built of steel on piles and concrete foundations with granite caps. The distance from the surface to the under side of the crane will be 92 feet. The trestle will be 60 feet high, and will have a 20-foot gauge track. The crane will lift 16 tons at a distance of 60 feet either side of its center, and 5 tons at a distance of 95 feet from the center. It will have a total span of 202 feet, reaching over two vessels, one on each side. Only one side of the crane will be employed in the construction of the battle ship "Connecticut." The crane will be driven by Elwell-Parker electric motors of from 80 to 120 horse-power.

The "Connecticut" type of battle ship will be the largest of the United States navy, being 78-foot beam, while the largest now in existence or building is 72-foot beam.

Work on the foundations for the crane will be commenced immediately. It is to be in operation inside of nine months. Mr. Stadelman also closed a contract with the New York Central Railroad for a "Brownhoist fast plant," a steam operated machine for unloading general merchandise, stone, &c., and transferring the contents of cars to vessels, or *vice versa*. The machine is to be used at the Port Morris Dock, and will have a lifting capacity of 5 tons.

The interests of A. Falkenau and the Philadelphia Machine Tool Company, Philadelphia, Pa., have been combined under the name of the Falkenau-Sinclair Machine Company, with offices at 109-115 North Twenty-second street. The new company have taken over the plants and business of the two concerns, and will have largely increased facilities for the designing and building of high grade machine tools, special machines, presses, metal working machines, hydraulic machinery, &c.

The Gleason-Bailey-Sciple Mfg. Company of Seneca Falls, N. Y., have acquired the plant and business of the Gleason & Bailey Mfg. Company of Seneca Falls, and will install an entire new machine tool equipment for the production of gas and gasoline engines, hand pumps and pumping machinery of every description. The original concern were established in 1839. F. C. Beebe is the general manager.

Henry S. Manning of Manning, Maxwell & Moore, who is the principal stockholder of Pedrick & Ayer of Philadelphia, stated to a representative of *The Iron Age* that the new shop at Plainfield, N. J., is to be devoted to the building of an entire line of compressed air machinery. He said that the product of the new works will consist mainly of air compressors, pneumatic hoists and railroad tools. Certain lines of machine tools, which the company are now building at Philadelphia, will doubtless be dropped, and the Plainfield shops are not to build machine tools. As was noted in these columns last week, the principal machine shop will be 100 x 500 feet.

The German-American Steel Ball Company and the Interstate Ball Bearing Company of 95 Liberty street are having plans prepared for a plant, which is to have a capacity of 250,000,000 steel balls annually. The location for the plant has not as yet been decided upon, and the plans are not sufficiently matured to show what equipment will be required.

Several large pumping outfits are soon to be purchased. At Elyria, Ohio, bids will be received on August 7 for two

2,000,000-gallon pumping engines, a filter plant, stand pipe and a considerable quantity of water pipe. The Water Works Board who have the matter in charge consist of P. H Boynton, president; George E. Crisp, secretary, both of Elyria, Ohio, and L. E. Chapin of Canton, Ohio, consulting engineer.

The Board of Water Commissioners of Yonkers, N. Y., will open bids on August 7 for a horizontal, high duty, compound condensing duplex, direct acting pump, having a capacity of 8,000,000 gallons in 24 hours at low service pumping station. Joseph H. Beall is president of the Board of Water Commissioners.

Proposals will be received at the office of the Commissioners of the District of Columbia until 12 m., Saturday, September 6, for furnishing and erecting a coal and ash conveying equipment for the Trumbull street pumping station, Washington, D. C. Specifications, blank forms of proposal and all necessary information may be obtained from Henry B. F. Marfarland.

On September 5 the Commissioners of Public Works of Milwaukee will open bids for erecting at the high service pumping station, North avenue and Tenth street, one 8,000,000-gallon pumping engine and one horizontal tubular boiler. Charles J. Poetsch is Commissioner of Public Works.

It will be recalled that on August 12 the bids will be opened for the large centrifugal pumping plant to be installed at New Orleans, La. Hering & Fuller, consulting engineers, 170 Broadway, have prepared the specifications.

At the National Soldier's Home, Treasurer's Office, proposals will be received until August 22, 1902, for furnishing materials, labor, &c., and constructing and setting in place in the boiler house of the Southern Branch, N. H. D. V. S., near Hampton, Va., three steam boilers. W. H. H. PECK, treasurer.

Woolston & Brew received an order from the Norristown Iron Works of Norristown, Pa., for a 300 horse-power Brown-Corliss engine. They also received the engine order from the American Tobacco Company for their Allen & Ginter branch at Richmond. This will be a Ball engine.

Manning, Maxwell & Moore, 85-89 Liberty street, New York, have just issued list No. 9 of second hand machinery which they now have for sale. The list includes several hundred machine tools of all types and sizes, as well as a number of traveling cranes.

New York.

NEW YORK, July 30, 1902.

Pig Iron.—Practically no domestic Iron is available for the use of Eastern foundrymen, who are in need of stock. Sales of foreign Iron are therefore increasing, and importations are now being made to meet the sharp demand for prompt delivery, dealers taking their chances of selling a shipment to needy consumers before it arrives or shortly after it is landed on the dock. Foreign Iron is now setting the pace for any business requiring delivery this year. Prices realized are from $22 to $25, ex-ship, according to grade and time of delivery, the higher quotation being easily obtained for spot Iron, which can be delivered at once. Consumers are freely contracting for domestic Iron for delivery in 1903, and are apparently actuated by a determination to order enough to cover their requirements, as they are frequently taking double the quantity they usually buy at one time. It is believed that even if the miners' strike ends within the coming month the Eastern furnaces will not be able to attain their normal rate of production until well toward the end of September. For delivery in 1903 the following quotations are made: Northern Iron, at tidewater, No. IX, $22. 75 to $24.75; No. 2 X, $21.75 to $22.75; No. 2 Plain, $20.75 to $21.75. Tennessee and Alabama brands, in New York and vicinity, No. 1 Foundry, $22 to $23; No. 2 Foundry, $21.25 to $22; No. 3 Foundry, $20.75 to $21.25.

Cast Iron Pipe.—Elyria, Ohio, is asking for bids on 4605 tons of 6 to 20 inch Water Pipe, 50,000 lbs. of special Castings, 75 Fire hydrants, a Stand Pipe, 30 x 120 feet, two pumping engines, boilers, filter plant, &c., the bids to be received until August 7. Current business in Cast Pipe consists of small orders, but Eastern foundries are still unable to take only a part of them for lack of Pig Iron. Manufacturers quote 6 and 8 inch Pipe at $34.50 per gross ton, New York.

Steel Rails.—The mills have booked further orders for 1903, and it is now estimated that with about 400,000 tons of unfilled contracts carried over they are already assured of 1,600,000 tons for next year. Heavy Sections continue to be quoted at $28, Eastern mill. Light Rails are being imported to meet the pressing demand for them.

Finished Iron and Steel.—The mills appear to be making more vigorous efforts to meet the demand for Structural Material, as shipments are reported to have improved. They are receiving assistance from engineers, who are taking more care to specify standard sizes and shapes, thus facilitating rolling. The American Bridge Company have received an order for 3500 tons from the Chicago & Western Indiana Railroad for track elevation work in Chicago, also one for 2000 tons for car barns for the Metropolitan Street Railway Company, New York. The volume of business in all manufactured products is heavy and prices are firm. We quote at tidewater as follows, but for small lots and prompt delivery much higher prices are being obtained for Structural Material and for Plates: Beams, Channels and Zees, 2c. to 2.25c.; Angles, 2c. to 2.25c.; Tees, 2c. to 2.25c.; Bulb Angles and Deck Beams, 2.10c. to 2.25c.; Sheared Steel Plates are 2c. to 2.10c. for Tank, 2.10c. to 2.20c. for Flange, 2.25c. to 2.40c. for Fire Box. Refined Bars are 1.95c. to 2c.; Soft Steel Bars, 1.95c. to 2.10c.

Metal Market.

NEW YORK, July 30, 1902.

Pig Tin.—Sympathetic with the London market, prices here have declined somewhat during the week. There were slight fluctuations, but the tendency has been steadily downward. Business has been extremely dull. Arrivals this month have amounted to 2352 tons. Afloats now aggregate 3015 tons, of which more than one-half is expected to arrive within the next ten days. Consequently a scarcity of the metal here is not feared, and consumers are resting easily regarding future supplies and awaiting a lower market for making large purchases. Closing prices here to-day were as follows: Spot to July, 28.10c. to 28.30c.; August, 28.10c. to 28.25c.; September, 27.75c. to 28.15c.; October, 27.50c. to 28c.; November, 27.25c. to 27.90c. The London market shows a decline of 10 shillings as compared with last week, to-day's closing quotations being: Spot, £127 10s.; future, £125 12s. 6d.

Copper.—The position is entirely unchanged. Demand has been slight, and prices are unchanged. There has been no increase of export business. Prices are still considered to be in buyers' favor. Even in a speculative way the market has been inactive, and no large sales are reported on 'Change. Lake is quoted 11.75c. to 12c.; Electrolytic, 11.75c. to 11.90c.; Castings, 11.65c. to 11.75c.; Standard, 11.30c. to 11.60c. These prices are all based on spot to November delivery. The London market quotes: Spot, £52 15s.; futures, £53. Best Selected declined 10s. further to £57.

Pig Lead.—The market here is entirely without change. The Smelting & Refining Company still quote Desilverized 4.12½c. for spot and 4.10c. for futures, New York. The London market declined 2s. 6d. to £11 2s. 6d.

Spelter.—The market is not quite as firm as it has held during the last few weeks. Spot is still firmly held, however, and is quoted here 5.37½c., which is unchanged from last week. The St. Louis quotation has declined 10 points from last week, and is quoted to-day at 5c. September St. Louis is quoted 4.95c. London has declined 3 shillings 6 pence to £18 17s. 6d.

Antimony—Has again declined a shade. Hallett's is quoted at 8c. and Cookson's at 10.25c. Other brands are 7¾c.

Nickel—Has declined somewhat. Large quantities down to ton lots are now quoted at 40c. to 47c. per lb., according to size and terms of order. Smaller lots are quoted as high as 60c., according to quantity.

Tin Plates.—This market is unchanged. The American Tin Plate Company are quoting for delivery up to October 1 on a basis of $4.19 per box of Standard 100-lb. Cokes, f.o.b. New York, or $4, f.o.b. Pittsburgh district. Quotations from Swansea show a decline of 1½ pence to 13 shillings 3 pence.

Iron and Industrial Stocks.

The past week witnessed a continuance of the strong market for stocks until Tuesday, when a slight reaction set in. The strength of the market extended from the railroad stocks to the industrials, some of the latter making important gains, especially Cambria, Colorado Fuel, Republic and Tennessee Coal & Iron.

The report of the Pressed Steel Car Company for the quarter ended June 30, just issued, is a most gratifying exhibit in point of earnings as compared with the report of the corresponding quarter of last year, showing the following financial results:

	1902.	1901.	Increase.
Net earnings	$934,093	$511,918	$422,175
Charges, preferred dividends and depreication	342,293	230,098	112,195
Surplus	$591,800	$281,820	$309,960

The output of the Pressed Steel Car Company this year will be greater than in any year since the company's organization.

The report of the International Steam Pump Company for June and for the three months ending June 30 shows a

marked increase in the volume of business handled, and, of course, a substantial gain in earnings. Orders taken in June aggregated $1,312,390, against $793,837 in June, 1901, and $607,238 in June, 1900. On June 30 orders on hand amounted to $5,653,401, against $2,439,182 at the same time in the year before. For three months orders received amounted to $2,759,155, against $2,313,077 in the corresponding period in 1901.

Reports are persistently circulated that negotiations are proceeding for the consolidation of the American Car & Foundry Company and the Pressed Steel Car Company, and that some of the largest houses in the financial district of New York are interested.

Dividends.—The Allis-Chalmers Company on July 23 declared the fifth consecutive quarterly dividend of 1¾ per cent., payable August 1 out of net earnings.

The Tri-State Gas Company, at Pittsburgh, have declared and paid the regular monthly dividend of 1 per cent.

The Jefferson and Clearfield Coal & Iron Company have declared a dividend of 2½ per cent. on the preferred stock and 5 per cent. on the common, payable August 15.

The Pressed Steel Car Company have declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable August 20, and a quarterly dividend of 1 per cent. on the common stock, payable August 27.

The directors of the Westinghouse Electric & Mfg. Company of Pittsburgh have declared the regular quarterly dividend of 1¾ per cent. on the second preferred stock, payable August 15.

The Ashton Valve Company, Boston, have declared a regular quarterly dividend of 1½ per cent., payable August 15.

The Westinghouse Brake Company, Limited, of London, England, have declared the usual semiannual dividend at the rate of 20 per cent. per annum.

Decrease in Voluntary Bankruptcy Cases.

WASHINGTON, D. C., July 26, 1902.—The returns from the clerks and the referees in bankruptcy for the six months ending March 31, 1902, have been received and compiled by the Department of Justice, and through the courtesy of Mr. Brandenburg, in charge of bankruptcy matters, the correspondent of *The Iron Age* is enabled to present some interesting details, which show the general tendency of this movement both as to voluntary and involuntary cases.

The most suggestive features of these returns are a substantial decrease in the number of voluntary cases as compared with the same period of 1901; an increase in the number of involuntary petitions filed; a relative increase in the assets as compared with liabilities in both voluntary and involuntary cases, and a proportionately excessive number of voluntary cases in the Southern States.

The decrease noted in voluntary cases indicates that the high water mark in this class has been reached, and that the large number of small merchants who had secured discharges under State laws prior to the enactment of the Federal bankruptcy law have now obtained discharges under the national statute and that hereafter a steady decline in voluntary cases may be looked for. The increase in the proportion of assets to liabilities is of course a most gratifying showing, and to some extent is due to the fact that discharges are no longer being granted to old State bankrupts who possessed practically no assets whatever.

Voluntary Cases.

The total number of voluntary petitions filed for the six months ending March 31, 1902, was 9052, as compared with 9787 for the corresponding period of 1901. The statistics for the two periods are as follows: Adjudications, 1901, 9544; 1902, 8990; discharges granted, 1901, 7364; 1902, 6974; discharges refused, 1901, 44; 1902, 34; compositions confirmed, 1901, 91; 1902, 75; compositions refused, 1901, 3; 1902, 1; cases closed, 1901, 7623; 1902, 7455; assets realized, 1901, $3,933,644; 1902, $3834,655; liabilities, 1901, $89,786,925; 1902, $70,450,805; total fees and expenses, 1901, $415,135; 1902, $416,785; nature of business, farmer, 1901, 835; 1902, 747; wage earner, 1901, 4088; 1902, 3505; merchant, 1901, 1553; 1902, 1458; manufacturer, 1901, 131; 1902, 112; professional, 1901, 151; 1902, 263; miscellaneous, 1901, 865; 1902, 912; pauper cases, 1901, 502; 1902, 458.

Involuntary Cases.

The statistics of the involuntary cases are as follows: Petitions filed, 1901, 1129; 1902, 1239; adjudications, 1901, 779; 1902, 784; discharges granted, 1901, 254; 1902, 293; discharges refused, 1901, 8; 1902, 5; compositions confirmed, 1901, 52; 1902, 68; compositions refused, 1901, 1; 1902, none; cases closed, 1901, 357; 1902, 342; assets realized, 1901, $996,088; 1902, $1,663,348; liabilities, 1901, $5,130,131; 1902, $7,083,059; total fees and expenses, 1901, $125,861; 1902, $177,037; nature of business, farmer, 1901, none; 1902, 5; wage earner, 1901, 33; 1902, 30; merchant, 1901, 221; 1902, 257; manufacturer, 1901, 29; 1902, 39; professional, 1901, 4; 1902, 2; miscellaneous, 1901, 70; 1902, 8; pauper cases, 1901, 1; 1902, 1.

New York naturally led the list of States in the number of petitions filed as to both voluntary and involuntary cases. In the former category the leading 12 States were as follows: New York, 1050; Illinois, 1016; Massachusetts, 749; Alabama, 697; Maine, 433; Ohio, 404; Iowa, 394; Minnesota, 310; Georgia, 277; Pennsylvania, 266; California, 221; Texas, 216. Missouri had but 144 cases, New Jersey but 102 and Wisconsin but 116. Nevada returned but a single case.

The leading States making returns in involuntary cases were as follows: New York, 213; Pennsylvania, 99; Illinois, 83; Texas, 81; Massachusetts, 58; Ohio, 53; South Carolina, 46; Georgia, 45; Missouri, 41; Alabama, 41; Mississippi, 35, and Wisconsin, 26. New Jersey returned 24, while Porto Rico brought up the rear with one case.

Of the total liabilities returned for the entire country, nearly 30 per cent. were scheduled in New York State, while of the involuntary cases only a little more than 12 per cent. were returned from the Empire State. The assets as compared with liabilities in voluntary cases were very low in New York, but in involuntary cases were relatively high. W. L. C.

George D. Devitt, for about 20 years superintendent of Mabel Furnace, at Sharpsville, Pa., owned by Perkins & Co., Limited, but operated by M. A. Hanna & Co. of Cleveland, has resigned to accept the position of superintendent of furnaces Nos. 1, 2 and 3 of the Shenango Furnace Company, at Sharpsville, Pa., succeeding George L. Collard, formerly assistant superintendent of these furnaces, but who has just been appointed superintendent of the three blast furnaces now being built by the Clairton Steel Company at Clairton, Pa. W. A. Barrows, formerly of the Shenango Furnace Company, at Sharpsville, will in the future have charge of ore matters for W. P. Snyder & Co., this firm supplying ore for the Shenango and Clairton furnaces.

The Northern Engineering Works, Detroit, Mich., report among other sales and installations of their three-motor electric traveling cranes, through Chas. E. Stamp & Co., sales agents for Cleveland district, the following: To the American Steel & Wire Company, one 25-ton, one 50-ton and one 15-ton, five motor; Theodore Kundtz, one 10-ton and one 5-ton; Shelby Tube Company, two 3-ton; Republic Iron & Steel Company, one 15-ton ingot crane and one 3-ton; Novelty Iron Works, Canton, one 10-ton; Aultman & Co., Canton, one 10-ton; Youngstown Steel Casting Company, one 20-ton and two 5-ton, besides a large number of smaller electric and hand power cranes in the same district. A steadily increasing demand for their electric cranes is reported.

The August number of *Graphite*, just issued by the Joseph Dixon Crucible Company of Jersey City, N. J., besides many valuable notes, setting forth the different forms of graphite manufactured by them, and their respective uses, contains an interesting article on the use of their silica-graphite paint for steel cars and metals in general exposed to the weather, as a protector from corrosion. Accompanying are half-tones of the entrance gates of the residence of William L. Elkins, at Ogontz, Pa., painted for protection and effect, and a section of the New York Dock Company's stores, Brooklyn water front, whose thousands of iron shutters are painted with Dixon's silica-graphite paint to resist the corrosive action of sea air.

Trade Publications.

Electrical Tables.—A valuable pamphlet has been issued by the American Steel & Wire Company containing tables of value to the electrical engineer. The first is a table of dimensions and weights of pure copper wire, which gives in parallel columns the B. & S. gauge, diameter in mills, the area of circle, mills and square inches, the weight and length in pounds per 1000 feet, in pounds per mile and the feet per pound. The second table is of comparative sizes of wire gauges in decimals of an inch. These including the number of the wire gauge, B. & S., American Steel & Wire Company, Stubbs, English Legal Standard and Old English or London. The next is a comparison of the pounds per 1000 feet of copper wire of the same size numbers of different gauges. The same thing is also given for lengths per mile. The next is a table of resistance of pure annealed copper wire, the columns giving the gauge number, ohms per 1000 feet, and ohms per mile, and feet per ohm, and ohms per pound. Also the logarithm of d^2 and the log. of R. Copper conductors are also covered, and there is a table of sizes, weights and lengths of iron and steel wire by the American Steel & Wire Company's gauge. This is followed by the approximate weights of the standard copper cables, both bare and weather proof, magnet wire, braided cables, &c. The various types of rail bonds made by the company are also illustrated.

Milling Machine Attachments.—An interesting pamphlet has been brought out by the Garvin Machine Company, Spring and Varick streets, New York, dealing in milling machine attachments. Their multiple center device is a valuable tool for manufacturing work, such as fluting taps, reamers, making small key ways, &c. A number of small pieces are operated on at once, and all are indexed together, saving a good deal of time. This device is made with from two to six spindles, both large and small. They are built of various center distances, some being arranged for spiral fluting, and others made to adjust for taper work. All are designed to index simultaneously. They are, for the most part, set in large cast iron ways, and arranged for pumping connection to the oil reservoir. Their spiral gear and worm milling attachment is used for milling spirals on their Universal milling machines. By its use spiral ways and worms can be milled whose angle would require the table, if milled by the regular method, to be swiveled through an angle of more than 45 degrees, but with this device no swivel of the table is required, the attachment being simply rotated so that the cutter makes the required angle with the center of the arbor on which the work is being cut.

Marine Boilers.—Marine boilers of several types are described in a catalogue of the Kingsford Foundry & Machine Works, Oswego, N. Y. Their compact marine boiler was designed especially for use with the smaller powers in tugs and yachts where little space is available. This boiler has a crown sheet circular in form, and there are, therefore, no braces over the fire, the form of sheet making itself sustaining. The value of this form of construction is appreciated when washing out, as a perfectly smooth surface is met with. The same amount of heating and grate surface can be furnished in boilers of this type as is usually found in water tube boilers occupying the same space.

Air Compressors.—Air compressors, carbonic acid, vacuum and tar pumps, compressed air tools and appliances, &c., are described in a pamphlet by the American Air Compressor Works, 26 Cortlandt street, New York. This company have had an experience of many years devoted exclusively to the construction of the Clayton air compressors. The works are equipped with the very latest improved machinery, including pattern shop, blacksmith shop and foundry. The American compressors while simple in design, durable and economic in power consumption, embody all the good features of the Clayton, together with many new and needed improvements, thereby bringing the machine strictly up to date in all its features.

Magnetic Separators.—The Elm City Engineering Company of New Haven describe their magnetic separators in a pamphlet. A point of superiority of this machine is that the magnetic cylinder is always of the same size, a point that is very essential to the satisfactory working of the separator. All parts of the machine are made in the most careful manner, and the best material only enters into its construction. The machine has a capacity from 3000 to 10,000 pounds of stock in ten hours according to the material used. It is designed to operate at a 110 volt circuit and consumes 4.3 amperes.

Loose Pulley Oiler.—The E. W. Van Dusen Company of Cincinnati have designed an oiler for loose pulleys. It is screwed into the hub of the pulley perfectly tight, as near the center as possible, so that the oil will not leak out nor air enter the oiler by way of the screw on the shank. The oiler is so designed that the oil flows toward the bearing during the revolution of the wheel.

A Pamphlet has been prepared by the Monarch Smoke Preventer Company of Cincinnati dealing with their method of smoke prevention. It is stated that with this system any kind of coal can be used and increased boiler efficiency results.

The Oil Filter and Purifier, made by the Burt Mfg. Company of Akron, Ohio, is covered in a recent pamphlet. This company have been making oil filters for 12 years past, and during that time have made and tested every kind of device for this purpose.

Saunders Pipe Machines.—The last catalogue by D. Saunders' Sons, Yonkers, N. Y., deals very thoroughly with their wide line of pipe threading machines, special machines for pipe mills, tapping and drilling machines, hand stocks and dies for pipe, &c. In their No. 4 C improved pipe threading, cutting and nipple machine, the arrangement of the chuck is such that the pipe is gripped or loosened by the simple movement of the lever, without the necessity of stopping the rotating motion of the gripping chuck, as is the case when the ordinary pipe machine gripping chucks are used—namely, the universal or independent. The movement of the gripping jaws is applied through a system of sliding blocks and levers, which gives the required motion to the chuck jaws to grip any size pipe within the range, 1 to 4 inches, and provides sufficient leverage to grip it firmly by an easy motion of the lever. The operation of adjusting the jaws to grip the different sizes of pipe is very quickly made. After the pipe has been threaded and has to be moved to adjust it for cutting off, or for any other reason, the die head is pushed to one side, allowing the pipe ample room to pass through the cutting head without passing through the die head to the injury of the chasers by the pipe sliding over them.

Spiral Rivet Pipe is the subject of a late catalogue of the American Spiral Pipe Works, 64 Wabash avenue, Chicago. The merits of this pipe are well known. It possesses strength, tightness, lightness and durability. It is supplied by the company asphalted, galvanized or double galvanized as may be desired. In both the asphalting and galvanizing the pipe is immersed in the fluid, thus securing perfectly coated inside and outside surfaces. If desired for pressure uses of either water or steam it is subjected to hydrostatic tests sufficient to allow for an ample margin of safety. The standard length of spiral rivet is 20 feet, but the asphalted pipe can be furnished in lengths up to 25 feet. It is furnished up to 16 inches in diameter and of different gauges of steel. The catalogue also illustrates and describes the connections used with pipe of this character.

Pipe Coils.—Farwell & Rempe Company, Sacramento and Carroll avenues, Chicago, manufacturers of wrought iron pipe coils, announce that with their increased facilities they are enabled to meet the wants of customers with a greater degree of promptness. Their illustrated catalogue of coils, manifolds, ammonia fittings, &c., is of special interest to manufacturers of ice and refrigerating machines, feed water and car heaters, as well as to cold storage houses, chemical works, blast furnaces, soap factories, &c. The catalogue is provided with an index for ready reference, and is reinforced by a number of valuable tables, specially designed to the needs of their customers.

Blackwell's Alloys.—George G. Blackwell Sons & Co., Limited, the Albany, Liverpool, England, have issued illustrated pamphlets relating to the line of business which they conduct. The firm are metallurgists, manufacturers and merchants, whose specialty is the supplying of iron and steel alloys, manganese and other materials used by iron and steel manufacturers. One of the pamphlets is a reprint from the *Iron and Coal Trades Review*, giving a full description of the operations of the firm, together with illustrations of the works in which they are interested, mines from which the minerals are obtained which they handle, laboratories, offices, &c. Another pamphlet is entitled "A Word to the Wise," and gives points for iron and steel makers, alluding specially to Blackwell's S. A. M. alloy, which is particularly useful in the manufacture of steel for the avoidance of blow holes and the production of sound ingots and castings.

The industrial school which is being erected on Ninth avenue, Homestead, by Charles M. Schwab, president of the United States Steel Corporation, is nearing completion and arrangements are being made to dedicate the school in September. The building has been in course of erection for more than a year, and when completed will have cost about $100,000. It is built of buff brick, with Cleveland sandstone trimmings. C. M. Schwab will attend the dedication, and President Roosevelt has also been invited to be present.

The West Virginia Iron Company, 66 Broadway, New York, will erect a plant at Clarksburg, W. Va.

President W. B. Leeds on the Outlook.

President W. B. Leeds of the Chicago, Rock Island & Pacific Railroad Company in an interview in the New York *Commercial Advertiser* speaks most hopefully regarding the business situation. An abstract of his opinions is as follows:

Commercial prosperity is going to last. Of course, it ebbs and flows always. I think the restrictive influence on some people is caused largely by the recollection of 1893, and it is impossible to get them away from the basis of that year. In the period following 1893 our currency system was reorganized and in it, it seems to me, was eliminated the only underlying weakness discernible in the business structure.

Need of Railway Extension.

During the hard times following 1893 two things resulted from enforced practice of economy. One was the natural growth of the country was not provided for, the other was the discovery of the true basis of handling our enormous railroad tonnage. In 1893 we had 63,000,000 of people; in 1900, 77,000,000. Since the former date we have only begun to build, to take care of the additional 14,000,000 souls, a nation in themselves. In 1910 we shall probably have 90,000,000 of people. I don't think the growth of railroads at present has been any more than sufficient to take care of the population of 1900, and we have still to increase our facilities and broaden our structure to take care of the 90,000,000 in 1910, which is, of course, only a short way off in the course of the business world.

In addition to caring for the wants of our own people it becomes this country's destiny to meet and fill the increasing wants of the world. Careful investigators in the different countries in rivalry with us are almost unanimous in their feeling that the cost of their raw material is so great that they cannot more than care for their own increasing wants within themselves and retain their present hold on foreign trade; that most of the increasing growth of the foreign trade of the world and the multiplying necessities of manufacturing nations will necessarily fall upon the United States. The other countries will hold their own, but the constantly expanding needs of the world will, to a very large degree, devolve upon America. Without in any way jeopardizing the growth of foreign countries, foreign trade of the United States will increase in so much greater proportion that the future holds the promise of steady employment for the manufacturing plants of the United States, and a recurrence of anything like the conditions that confronted us in 1893 is impossible.

Outlook in the West.

Present prospects of business on the Western roads have never been excelled, according to the reports and the judgment of those who have been watching conditions for 25 years. It is the lack of moisture and not the excess of it that damages the West. In some of the lowlands the recent floods have caused a little damage, but in proportion to the total acreage under cultivation the injury is so slight that the general result has not been affected. In some instances oats have been hurt to the farmer, but not as a tonnage proposition. Just as many tons of oats, regardless of the grading, will be carried to the market. Prospects are that an enormous corn crop will be recorded. Moderate estimates figure the yield at 2,500,000,000 bushels. Many careful, competent judges are of the opinion that the average will be much higher, possibly 3,000,000,000. The prosperity, which has been general all over the country, has, to greater degree, extended throughout the Western country served by the roads west of the Mississippi River, whereby consumers have been enabled to increase and develop resources at hand, instead of pursuing the hand to mouth policy which was forced upon them because of past depression. With the reserves of the past added to this year's enormous agricultural products, the country served by the Western roads will for the year 1802 be placed in a position distinctly in advance, both in producing and consuming, over that of the past year. The richer they get the stronger they are, both for the producer and the consumer.

Follansbee Brothers Company.

Follansbee Bros. Company of Pittsburgh, manufacturers of tin and terne plate and large jobbers in sheets and metal goods, have bought a tract of land at Mahan Station, on the Pittsburgh, Wheeling & Kentucky branch of the Panhandle Railroad, near Wheeling, W. Va., and will build on a part of the site a modern plant to contain four sheet and four tin mills. Contracts for much of the equipment and the building were placed some time since and the work of excavation has been finished. The new plant will be built as rapidly as possible and it is expected to be ready for operation early next year. A galvanizing works will be included. The company will manufacture black and galvanized sheets, corrugated sheets, eaves trough, siding and roofing and tin and terne plate. Follansbee Bros. Company have operated a tin plant in Allegheny, Pa., for some years and this will be removed to the new works as soon as they are finished. The name of the station at which the new plant is located will be changed from Mahan to Follansbee. Abundant rail and river shipping facilities will be enjoyed as well as cheap coal and natural gas.

Duty on Plate Shearings and Nail Rods.

The Board of General Appraisers, New York, on July 17, decided that boiler plate shearings are not dutiable as steel billets under paragraph 135, act of July 24, 1897, but are dutiable as scrap steel at the rate of $4 per ton under paragraph 122 of said act, giving their opinion as follows: "The importers claim that said merchandise is properly dutiable at the rate of $4 per ton, under the provisions of paragraph 122, as scrap steel. The precise question raised by the protests was the subject of this board's decision in G. A. 4825. The board in that case held that the merchandise there in question, consisting of the pieces which fall off in trimming boiler plates, was dutiable as scrap steel and not as billets, as claimed by the Government. On appeal to the United States Circuit Court for the Southern District of New York, in the case of United States *vs.* Milne (not yet published), this decision was affirmed on the opinion of the board. The Treasury Department, in T. D. 23843, has acquiesced in said decision and the same has become final. Following the above ruling, we sustain the protests and reverse the decision of the collector."

On the same date they also decided that nail rods are specifically provided for in paragraph 136, act of July 24, 1897, and the fact that such articles are made by the charcoal process will not take them out of the operation of that paragraph. The importers claim that such merchandise is properly dutiable under the provisions of paragraph 136 of said act as nail rods at the rate of fourtenths of 1 cent per pound, and this claim is sustained by the board.

The Tin Plate Wage Reduction.—By Monday next it will be known definitely whether the employees of the tin plate mils will accept the proposed cut in wages when working on tin plate for export. The final vote will be an "aye" and "nay" one, and it is confidently stated now that the vote will be against accepting the reduction. Some lodges have voted in favor of it, but more have voted against it, and the men will not accept the proposed cut. The officials of the Amalgamated Association favored the proposed cut and tried to get the men to accept it, but to no purpose. What action will be taken in the future by the respective parties, the American Tin Plate Company and the Amalgamated Association, remains to be seen.

The Structural Steel Car Company, Canton, Ohio, advise us that their new works are almost completed, about 90 per cent. of the work being finished. The company expect to be turning out steel cars within 30 days.

HARDWARE.

SOME manufacturers are content from year to year to continue making a single limited line of products. This is sometimes owing to the fact that limited ability or the stress of adverse circumstances prevents them from branching out with the enterprise and success which characterize the operations of the representative American manufacturer. In other cases the course they pursue while not giving them large returns at first is justified as a wise policy in the long run, as on account of the merit of the goods which they produce they are enabled to establish a reputation which gives them a sure place in the trade and lucrative business, which renders them the envy of other manufacturers whose trade-mark is of comparatively little value and who realize that they have only a precarious place in the market. The manufacturer, however, who is representative of the American spirit and method does not belong in either of these classes. His constant aim and endeavor is to extend his business and not only give it a greater volume, but to make it cover a wider range of articles. The success of this policy is illustrated in an impressive way in practically every great Hardware manufacturing house. From a small beginning there has been a constant, and if allowance is made for variations in the volume of general business, a steady, increase from year to year in the number and variety as well as in the quantity of their products.

While the manufacturer is giving his best energies to the direction of his business in its existing form, whether large or small, there is a constant looking out for opportunities to take up new lines. Such addition to his products is regarded as desirable primarily because in this way a basis is laid for a larger business, provided the new goods can be placed on the market successfully. The manufacture of new articles is, however, often taken up under pressure of what may be termed manufacturing exigencies, as more complete use is thus made of existing manufacturing facilities and a certain department or series of departments in the factory is run more advantageously. The practical problem how to get the best obtainable results from a given part of the plant or from special ability in workmen or superintendent is frequently the reason for turning out an enlarged variety of goods. Considerations also which touch upon the marketing of the product have great weight. The manufacturer of a single article or of a limited line, unless it be an exceptionally important one, is at a disadvantage in bringing his product to the attention of the trade. As the line is increased this difficulty as a general rule diminishes. When the assortment is sufficiently enlarged he is enabled to adopt broader and more liberal methods in placing the goods upon the market. The expense of selling the product is thus proportionately diminished. Under the influence of this and other considerations which make for an extension of his line the representative manufacturer is producing from year to year a larger variety of goods and doing a business of increased volume.

It is not an infrequent occurrence for a manufacturer to cast about in a vague and general way for some article which can thus be added to his products. He has become by the experience of years familiar with the difficulties which attend the making of the goods which he is putting on the market, and knows only too well the stress of competition in this line and perhaps the meager profits which reward his efforts. Other goods appear to him to offer a much better prospect of satisfactory margins, especially if he can be fortunate enough to find some article or class of articles in which there is comparatively little competition and a broad difference between the cost and the selling price, which is the manufacturer's Eldorado. It is needless to say that this is a search which is often fruitless. It is difficult to find in the manufacturing field any ground which is not already occupied with painstaking care. The law of competition and the strife for profit are everywhere at work. For this reason the taking up of lines remote from the one in which the manufacturer is making even moderate success is often attended by disappointment, notwithstanding the anticipations with which it may have been entered upon. Each line has its peculiarities and drawbacks, a knowledge of which is sometimes acquired by a costly experience. For this reason the extension of business on lines in which the manufacturer is at home and which are closely related to those on which he has an established trade is the natural course and usually the wisest policy.

This principle has its obvious bearing on the control of the market by great corporations or through combinations of manufacturers. Any line the prices of which are put at a high level immediately and irresistibly invites competition. Not only do new manufacturers enter the field, if it be of sufficient importance to justify new ventures, but other manufacturers making more or less closely related products turn their facilities and experience to the making of what they anticipate will be exceptionally profitable goods. Under the operation of this law the aggregate production of the goods in question is largely increased, and often with the result of provoking a fierce strife for business. In this contest both the manufacturers who were once dominant in the market and those who entered upon what appeared an inviting field find that they have to be content with narrow margins and to take their chance in a struggle in which only those best equipped and best managed can succeed.

Condition of Trade.

The condition of business throughout the country is referred to at length and in detail in the very full advices given in the following pages. These letters which are from representative Hardware merchants will assist those who desire to form an intelligent judgment in regard to the situation and outlook in the various sections of the country. There is no doubt that the general tenor of the reports will be to give increased confidence to the expectation that a large business is to be transacted during the remainder of the year. The prosperity which is so prevalent gives abundant reason for the hopeful feeling which pervades the trade. The influence of adverse conditions in certain sections will be noticed, but it would seem that notwithstanding these hindrances to trade the outlook on the whole in every section is encouraging. The letters, aside from the information they give in regard to the prospects for business, touch incidentally on a good many matters directly connected with the interests especially of retail Hardware merchants. Notwithstanding the general agreement that business promises well, there is only a moderate activity in the market at this time. This is principally on account of the time of year, as summer influences and the vacation season have a marked effect. In view of the pressure of business during the six months past there is evidently on the part of both merchants and manufacturers a desire to avail themselves of at least a brief

period of relaxation and the success which has generally rewarded their operations encourages this disposition. A remarkable feature of the situation at this time is the unusually small stocks of goods which are in the manufacturers' warehouses. Not for years has the fall season been approached with such light and broken assortments. Many factories are still at work on orders taken months ago, and throughout the trade there is much correspondence in the way of hurrying shipments or explaining the delay in making them. This state of things, connected with the high prices of the raw material and the difficulty in obtaining it in certain lines, tends to keep the market steady and to give it even a strong tone. A few lines, owing to exceptional influences, are regarded with suspicion and give perhaps evidence of a slight weakness, but many others have an upward tendency. In several kinds of goods it seems not unlikely that there will be a scarcity. Manufacturers generally recognize the opportunity which this state of things affords them, and are obtaining good prices and refraining from contracting ahead except in a conservative way.

Chicago.

(By Telegraph.)

Reports from manufacturers, as well as from jobbers of Hardware, are that business is less active in most lines, but this is anticipated at this period. Yet orders which were held because of the strikes at this point have been booked, and the outlook for fall trade is very encouraging. There has been an advance in prices of Cast Iron Specialties, such as Cooking Utensils and Pitcher Spout Pumps, but as a rule there has been little tendency shown to make changes of importance in prices current. One feature of interest which is noted by jobbers is the unusual scarcity of Squares and Chisels, one of two houses reporting that they never before have had such difficulty in obtaining ample supplies. Some important contracts have been placed during the week by manufacturers for Wire Rope for fall delivery. Wire Nails have continued quiet, but the mills are so well in hand that the accumulation is less than usual. The meeting of the independent Wire and Nail manufacturers is being held to-day, July 30. No action of importance to the trade is to be taken, the meeting being the usual monthly gathering to consider conditions without change in prices being contemplated. The demand for Plain Wire, especially for Baling Wire, has continued active, but little, if any, improvement has been noted in the inquiry for Barbed Wire. There has been a fair demand for Builders' Hardware experienced by jobbers, but manufacturers are receiving fewer new orders. There has been quite a good demand for Screws, both for nearby and future delivery, and prices seem to be better maintained than usual. The wet weather in this section has had an important bearing upon the jobbing trade for Tire Steel. Usually business of this character is very active at this season, now orders are very few and far between. Manufacturers, however, are placing some large contracts for this material. Heavy Hardware, especially Structural Material, continues as scarce as usual and the demand urgent; liberal premiums are readily obtained whenever material is available for prompt shipment.

St. Louis.

(By Telegraph.)

Business in the Hardware market shows an advancing tendency, and indications all point to a favorable fall trade. Among the specialties in active call we might mention Coal Hods, Stove Boards, Elbows, Meat Cutters, Stuffers, &c., and for all of these and others the demand compares most favorably with that of other seasons. Important operations in the railroad world in this immediate territory will be of great benefit to St. Louis in all lines of trade. The plans on foot will open up much new territory tributary to this market, making St. Louis the center of supply. In considering these conditions, it means not only the enlarging of business from the jobbers' standpoint, but with the improvement and correction of some matters which now figure as serious obstacles the manufacturing importance of the city will be greatly increased. With a definite date for the World's Fair decided local conditions show improvement, and with the advance of the season home consumption, especially in Shelf and Builders' Hardware, will grow.

NOTES ON PRICES.

Wire Nails.—For Wire Nails the demand is largely confined to small lots. Nails are accumulating to some extent, notwithstanding the fact that many of the mills remain closed. Owing to the enormous freight traffic, complaint is made that some of the railroads do not get shipments to destination as promptly as could be desired. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots	$2.05
To jobbers in less than carload lots	2.10
To retailers in carload lots	2.10
To retailers in less than carload lots	2.20

New York.—While the summer quiet affects the demand from near by territory, small lots from store are moving in satisfactory volume, considering the season. Single carload lots are selling at $2.20, and small lots at $2.25 to $2.30 from store.

Chicago, by Telegraph.—The market for Wire Nails has been dull, the jobbing trade receiving light shipments, but mill production being curtailed. There has been less accumulation than usual in the hands of the mills at this time of the year. Single carloads are selling at $2.20 and small lots at $2.25 to $2.30 from store.

St. Louis, by Telegraph.—Wire Nails continue quiet, with prices on the old level. Carload lots are quoted at $2.25 and small lots from stock at $2.30.

Pittsburgh.—The Wire Nail trade continues quiet, but is fairly satisfactory for this season of the year. There is very little shading in prices by the mills, but some of the jobbers who have Nails in stock, bought some time ago when prices were lower, are making slight concessions in their quotations. We quote Wire Nails at $2.05 in carloads, but note that occasionally this price is shaded, depending on the order and point of shipment.

Cut Nails.—No change was made in the price of Cut Nails at the regular meeting of the Nail Association, but prices ruling for July were reaffirmed for the month of August. The demand for Steel Cut Nails is moderate, while Iron Cut Nails continue scarce. Quotations are as follows: $2.05, base, in carloads, and $2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—The local Cut Nail market remains unchanged, with a moderate demand. Quotations for carloads and less than carloads are as follows:

Carloads on dock	$2.18
Less than carloads on dock	2.23
Small lots from store	2.30

Chicago, by Telegraph.—No new features have been developed. The demand has been only medium, but supplies are still light and the market has remained at $2.30 for small lots from store.

St. Louis, by Telegraph.—The demand for Cut Nails continues quiet but steady; $2.40 is the quotation for small lots from jobbers' stock.

Pittsburgh.—Mills are making shipments of Cut Nails more promptly, but there is only a moderate demand and mostly for small lots. The tone of the market is fairly strong and we quote Cut Nails as follows: $2.05, base, in carloads, and $2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

Barb Wire.—The production of Barb Wire has been much reduced by the closing down of a number of the mills. Not much increase in demand is anticipated until orders for fall trade are placed. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days:

	Painted.	Galv.
To jobbers in carload lots	$2.60	$2.90
To jobbers in less than carloads	2.65	2.95
To retailers in carload lots	2.70	3.00
To retailers in less than carloads	2.80	3.10

Chicago, by Telegraph.—No improvement has been experienced in the demand for Barb Wire, but, all things considered, prices have been very well maintained. Galvanized is selling at $3 to $3.10 and Painted at $2.80 in carload lots, with 5 cents extra for small quantities.

St. Louis, by Telegraph.—No increase is to be noted in the demand for Barb Wire. Firmness prevails in the matter of price and Painted is quoted at $2.90; Galvanized at $3.20.

Pittsburgh.—Demand is light and a number of mills have closed down for repairs, thus restricting output very considerably. Prices are firm and are shaded only in exceptional cases, mostly by jobbers who have stocks bought when the market was lower than it is now. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days; Painted, $2.60; Galvanized, $2.90; less than carload lots, Painted, $2.65; Galvanized, $2.95.

Plain Wire.—The movement of Plain Wire from the mills is confined largely to shipments on old contracts. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots	$2.00	$2.40
To jobbers in less than carload lots	2.05	2.45
To retailers in carload lots	2.05	2.45
To retailers in less than carload lots	2.15	2.60

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9	Base				$0.40	extra
10	$0.05	advance	over	base	.40	"
11	.10	"	"	"	.40	"
12 and 12½	.15	"	"	"	.40	"
13	.25	"	"	"	.40	"
14	.35	"	"	"	.40	"
15	.45	"	"	"	.75	"
16	.55	"	"	"	.75	"
17	.70	"	"	"	1.00	"
18	.85	"	"	"	1.00	"

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—There has been a fair demand for Plain Wire, with a number of orders received for Straightened and Cut Wire, prices being generally well maintained. Sales in a jobbing way are made at $2.20 from store.

St. Louis, by Telegraph.—Trade is of a light order in the market for Plain Wire and in the matter of price no change is to be noted. No. 9 is quoted at $2.25 and Galvanized at $2.65.

Pittsburgh.—There is a moderate demand and the tone of the market is fairly strong. We quote Plain Wire at $2 and Galvanized at $2.40 in carloads, f.o.b. at mill, with the usual advances for small lots.

Steel Goods.—Reports have been current in the trade to the effect that manufacturers have been conferring with a view to forming some agreement by which the control of the market with, presumably, higher prices would be secured. It is said, too, that the manufacturers are declining orders for next season. The condition of the market in this line is, however, undetermined so far as next season's prices are concerned, and leading manufacturers intimate that there is little probability of any concerted action. The advanced cost of Steel, the higher prices paid for labor, the increase in the cost of Handles and the great difficulty in obtaining them are referred to as influences which will compel the announcement of higher prices beyond the very low figures to which the sharp competition of the past season depressed them. If, however, this competition continues and no arrangement is made between the manufacturers, it is possible that low prices may still prevail. In view of the large volume of business the past season there has been a great pressure on manufacturers for goods, and in view of the large harvests in several sections there is still a steady and a large demand upon their manufacturing facilities.

Axles.—The market for Axles is characterized by a decidedly firm tone, and prices are not only maintained, but have an advancing tendency. Manufacturers generally are full of orders and there is complaint of some delay in their execution.

Tarred Roofing and Sheathing.—In the business of Tarred Roofing products everybody seems to be midsummer busy, with a firm market and probability of a scarcity of stock and slow deliveries as soon as the fall trade sets in. Prices at present remain about the same as were made last spring, which, however, were sharply advanced at that time in consequence of the absorption of important competing interests and the working agreement arrived at with some of the independent concerns whose business was not taken over. Tarred Roofing, single ply, is now quoted $29 to $32 per ton, ranging from carload to less than carload lots; two-ply Roofing Felt, 55 to 65 cents, and three-ply, 77 to 87 cents per roll, the prices covering light to heavy weight stock. Rosin Sized Sheathing, in rolls of 500 square feet, is quoted at 35 to 37 cents, light, 25-lb. rolls; 42 to 45 cents, medium, 30-lb. rolls, and 56 to 60 cents, heavy, 40-lb rolls, the lower prices applying to carloads and the higher prices to less than carloads. Deafening Felt is $45 per ton and Slaters' Felt 70 cents per roll, carloads, and 75 cents per roll, less than carloads, the rolls containing 500 square feet.

Emmert Hartzell Cutlery Company.—A revised price-list has been issued by Emmert Hartzell Cutlery Company, Gettysburg, Pa., on their line of Butcher, Kitchen, Bread and Putty Knives and Scrapers. It is subject to a uniform discount of 50 per cent.

Cordage.—The market on both Manila and Sisal hemp is stiffer, owing to an advance in cost. This has had the effect of strengthening the Rope market, but without causing an advance in card prices. General quotations are as follows: Manila Rope, 12½ to 13 cents; Sisal Rope, 9¼ to 9½ cents per pound. In view of high prices mixed and Jute Rope is purchased to a considerable extent.

Glass.—During the week no progress has been made toward settling the undecided questions in the Glass industry. The wage committee representing the Independent Glass Company and that representing the company's operators are expected to hold a meeting during August, to decide upon a wage scale for the blast of 1902-3. The Independent Company still expect to start their factories on September 1. The American Window Glass Company may cut whatever scale of wages is adopted by the Independent Company, so that no forecast as to the future price of Glass is possible until the wages of all Glass workers are decided. The local Glass market remains quiet. The Jobbers' Association quotations are as follows for single and double strength:

	Discount.
From store	88 and 5 %
F.o.b. factory, carload lots	89 and 5 %

Oils.—*Linseed Oil.*—There are but few orders of any size being received for prompt delivery. A fair business for small lots is reported, and some movement of resale Oil is noticed at about 1 cent under regular quotations. The market is firm, largely through lack of buyers, and it is possible that any reasonable offer for large lots of Oil below the regular price would not be refused. Notwithstanding these conditions, quotations may be advanced for effect without, however, altering the selling price. Futures for delivery during the last quarter of the year are quoted at about 47 cents, with bids in the neighborhood of 42 to 43 cents per gallon. Quotations, according to quantity, are as follows: City Raw, 67 to 68 cents; out of town Raw, 66 to 67 cents per gallon.

Spirits Turpentine.—During the week liberal deliveries of Turpentine on local contracts have supplied most requirements and restricted demand to small lots. Receipts at Savannah are reported as being large and as having a depressing effect upon prices at that point. Local quotations, according to quantity, are as follows:

Southerns, 46 to 46½ cents; machine made barrels, 46½ to 47 cents per gallon.

PACIFIC COAST HARDWARE AND METAL ASSOCIATION.

THE seventh annual convention of the Pacific Coast Hardware and Metal Association was held at the Hotel Del Monte, Monterey, Cal., on July 16, 17 and 18. The meeting was well attended and found the members as enthusiastic as ever regarding the benefits and value of the organization. Subjects of general interest to the Hardware jobbing trade were discussed.

An interesting address was delivered by the retiring president, Brace Hayden, who touched, among other things, upon the greater stability in market prices which has existed during the past year, and which is more feasible under consolidations than with unrestricted competition; also to the lessened interference from manufacturers with the jobbing trade. Mr. Hayden also spoke of the satisfactory growth of the retail organizations on the Pacific Coast during the past year and of their consequent friendlier relations with the jobbing trade, which works greatly to the advantage of both.

The secretary, Hamilton W. Barnard, followed with a detailed report of the work undertaken by the association during the past year.

Reports of the treasurer and of the various standing committees were then presented, and the meeting proceed to the discussion of new business. Morning, afternoon and evening sessions were held on Wednesday and Thursday. At the final meeting the following officers were elected, to serve for the ensuing year:

PRESIDENT,
H. J. Morton, Pacific Hardware & Steel Company, San Francisco.
FIRST VICE-PRESIDENT,
T. D. Honeyman, Honeyman Hardware Company, Portland, Ore.
SECOND VICE-PRESIDENT,
L. C. Scheller, Union Hardware & Metal Company, Los Angeles.
THIRD VICE-PRESIDENT,
A. S. Burwell, Seattle Hardware Company, Seattle, Wash.
TREASURER,
Francis J. Baker, George H. Tay Company, San Francisco.
SECRETARY,
Hamilton W. Barnard, San Francisco.
EXECUTIVE COMMITTEE:
Wakefield Baker, Baker & Hamilton, San Francisco.
A. A. Watkins, W. W. Montague & Co., San Francisco.
A. L. Scott, Pacific Hardware & Steel Company, San Francisco.
Wm. R. Wheeler, Holbrook, Merrill & Stetson, San Francisco.
Andrew Carrigan, Dunham, Carrigan & Hayden Company, San Francisco.
George S. Scovel, Lloyd-Scovel Iron Company, San Francisco.
E. W. A. Waterhouse, Waterhouse & Lester, San Francisco.
ADVISORY BOARD,
Brace Hayden, of Dunham, Carrigan & Hayden Company, San Francisco.

There were but few changes among the officers, the principal ones being the succession of Mr. Hayden as president by Mr. Morton, Mr. Hayden having served the association long and faithfully as its executive officer. It is believed by the members that Mr. Morton will prove a worthy successor and will carry on the work of the association in an aggressive and thorough manner.

On Friday morning the Entertainment Committee took charge of the members, and several four-in-hands took them around the famous 17-mile drive, through old Monterey, Pacific Grove, past Cypress Point and Carmel Bay. The outing was much enjoyed by all, and Monterey was pronounced an ideal meeting place.

Out of courtesy to the Southern members the next convention will be held at Santa Barbara at the new hotel now being erected there.

AT the annual meeting of the stockholders of the Eagle Lock Company of Terryville and 98 Chambers street, New York, which was held at the office of the corporation in Terryville on Tuesday afternoon, July 29, the following named gentlemen were elected as a Board of Directors for the ensuing year: M. C. Ogden of New York; R. J. Plumb of Terryville; H. B. Plumb of Brooklyn, N. Y.; J. A. Carter of Geneva, Ohio; H. L. Balch and F. P. Wilcox of New York, and W. T. Woodruff of Thomaston, Conn. Subsequently the directors re-elected the following officers: President, M. C. Ogden; treasurer, R. J. Plumb; secretary, H. B. Plumb.

MICHIGAN RETAIL HARDWARE DEALERS' ASSOCIATION.

THE programme for the eighth annual convention of the Michigan Retail Hardware Dealers' Association has just been issued. The meeting will be held at the Hotel Cadillac, Detroit, August 13 and 14. After routine business at the opening session on Wednesday forenoon, 13th, a paper, entitled "Organization, Local and General," will be read by A. Harshaw of Delray. At the afternoon session the annual address of the president and the reports of the secretary and treasurer will be presented. Papers at this session will be read by J. H. Whitney of Merrill on the subject, "My Faults in Business as Others See Them," and by John Popp of Saginaw, who will discuss the subject, "Would Mutual Fire Insurance Benefit Our Organization?" The Thursday morning session will be devoted entirely to the reading and discussion of the following papers: "Best Methods of Conducting a Retail Hardware Store," by R. G. Chandler of Coldwater; "Retailer's View of a Jobber Who Retails," by B. F. Schumacher of Ann Arbor; "Advice to the Association of How to Treat An Offending Manufacturer," by H. W. Weber of West Bay City. In the afternoon at the closing session Hon. B. A. Nevins will address the association on "Each Viewing the Other, Consumer versus Retailer." The programme is thus an interesting and instructive one, and with the outside entertainment, which will be provided, the coming meeting should be one of the most enjoyable in the history of the association.

THE GROWTH OF LOCAL JOBBERS.

BY ONE WHO BELIEVES IN THEM.

THE greater number of the Hardware jobbing houses also conduct retail stores, and in these stores sell many articles too fine for the ordinary country trade, and which they do not attempt to job, although they use their jobbing business as a lever to secure wholesale prices. The manufacturer of such goods finds that the purchases of a Simon pure retailer will often exceed in quantity those of his jobbing customer, and in equalizing matters he either raises the price to the jobber or more frequently lowers the price to his retail customer to practically the same basis. The retail end of a combined jobbing and retail business naturally makes the most display, and it is not uncommon to hear a manufacturer's salesman refer to such a concern as "a retail store with a jobbing annex," particularly if he has quoted the best discount on his goods and gotten an order which from the varied assortment and small quantities he recognizes is for retail purposes.

The Hardware trade has hitherto been divided into two classes—the wholesale and retail—and according to the accepted theory of trade ethics the manufacturer reaches the retailer principally through the jobber. Common practice, however, does not bear this out, and for the sake of common honesty it is time for a revision of the Hardware creed by the recognition of a third class of Hardware merchants lying between the jobber and the retailer; a class that buys largely in case lots and bulk quantity from the manufacturer and "sorts up" stock by purchases of smaller quantities from the jobber. Many manufacturers now recognize his existence by the creation of a scale of prices with first, second and third, or A, B and C prices for wholesaler, free lance and retailer. It only remains to coin a name by which to designate this middle class and to define its limits to gain a recognition for a factor in trade the presence of which is known and felt, though its existence is regretted and its legitimacy is denied by the great jobbers. This class has the best paying business in the Hardware trade, and it is from its ranks that the new jobbing houses are recruited and the trade localized.

ADVERTISING.

BY GARIC.

Advertising in its various forms is one of the chief means of attracting trade. More and more attention is being given to it every day. Buying advertising space in a paper is like buying a horse. If one buys the right kind at the right price and then uses it in the right way he will get a good return for the investment. A man should not buy advertising space any more than he should buy a horse unless he has some use for it. Improperly used space eats up dollars faster than an idle horse eats oats. The result is money spent and no return. In the first case there is the memory of advertising space illy used; in the other, a live horse on which something can be realized.

SPACE SHOULD BE WISELY BOUGHT.

Newspaper advertising is one of the best means the Hardware dealer has at his disposal with which to draw trade. Advertising space must be bought and filled wisely. What Hardware merchant would send an order like this to a jobber?

FARMER, N. G., July 4, 1902.

MESSRS. JOBBER & CO.,
NEW YORK.

Gentlemen.—Please ship us at once 1 dozen Saws.

Yours truly,
A. RETAILER & SON.

What kind of Saws might that jobber send and still fill the order? He might send Back, Band, Butcher, Circular, Cross Cut, Hack, Ice, Rip, Scroll or some of the many other kinds of Saws. The size, the gauge, the number of teeth to the inch, the quality, the finish, the brand, &c., are all left to him. No merchant would order Saws in such an indifferent manner, but there are many concerns considered progressive and up to date who buy advertising space in the local weeklies in just this way.

POSITION.

They contract for a certain space, say a quarter of a column for a year, for so many dollars. They get generally just what they order—so much space each week for 52 weeks in some obscure corner of the paper, on a page filled with plate matter, patent medicine and mail order house advertisements, and with advertisements on top, bottom and both sides of the Hardware advertisement. It is like renting a lot for a pasture which is on a distant mountain. It is too far away. He has the space, but it is nearly worthless.

When buying advertising space in a local paper demand the best position available. It may cost a little more, but probably will not. If it does cost more it will doubtless bring in a greater return. It is better to have a small space where it will be read than a large space where no one sees it.

AN ADVERTISEMENT MUST BE READ.

Remember that the efficiency of an advertisement is directly proportionate to the number of persons of the desired class who read it. The best position for an advertisement is generally considered to be on the page devoted to local news, and surrounded on all sides by pure reading matter—not medical reading notices. The next best position is at the top of column with reading matter on both sides and below the advertisement. A position at bottom of column with reading matter on top and on both sides is also excellent. An advertisement, if the best returns are expected, should be so placed that there is good reading matter on one side of it at least with position at top or bottom of column preferred—the top of column being better than at the bottom. There are lots of good spaces in every paper which somebody has or can have, and the Hardwareman can have them just as well as anybody else, but he nor no one else will be given the best positions unless he demands them.

UTILIZATION OF SPACE.

Suppose that Jobber & Co. did send a dozen Saws to A. Retailer & Son. Would it be expected that the latter firm, when they received them, would put them in their damp cellar and wait for a customer to come while the Saws were deteriorating all the time for lack of proper care and attention? Still that is about the way that many a Hardware merchant does with his advertisement. For years it has appeared regularly in the local weekly, and has been as regularly paid for in trade. The type used is antiquated and worn. For years not a change has been made in the wording or display, except when it has been necessary for the printer to replace worn type with the "new" second-hand type he bought in the city. The advertisement reads something like this:

A. Retailer B. Retailer.

A. RETAILER & SON,

GENERAL HARDWARE,

STOVES and TINWARE.

Repairing a Specialty.

Such advertising is a waste of good money. Returns cannot be expected from it. The timely and thoughtful advertising which creates demand and sells goods is the only kind that pays, and it pays well.

A DUTY REQUIRING REGULAR ATTENTION.

Advertising must receive constant attention. One cannot expect to receive good results from an advertisement that is seldom or never changed, much more than he can expect to get heat from a stove in which fuel is seldom placed. The writing of an advertisement should be as much of the regular routine of office work as the striking of a balance or the sending out of statements. It should be a regular duty and should devolve on one person.

MAKE THE ADVERTISEMENT TALK.

Remember that an advertisement is a salesman. One would not expect to sell many goods through a dumb salesman—neither should a merchant hope to sell through an advertisement that says nothing. The person writing the advertisements should make the reader:

1. Notice the advertisement.
2. Read the advertisement.
3. Be impressed by the advertisement.
4. Buy what is advertised.

SHOULD BE ATTRACTIVE.

An advertisement must be attractive and it must say something, two qualities of the good salesman. The writer should know the Hardware business, know what things appeal to people, be a good judge of people, a good business man, be original, convincing and honest.

If advertising space is worth anything it is worth making the most of. It takes but little time to write a new advertisement each week, but it pays to do so. When an advertisement is brightly gotten up, and changed every week, people get to look for it. It is said that when Gillam took charge of John Wanamaker's advertising in Philadelphia, some years ago, and introduced the bright and interesting style which has been copied by department stores all over the country, it was not an unusual thing for persons to look at the Wanamaker advertisement before referring to the news columns. The same thing to an extent can be secured by a progressive Hardwareman if he makes an advertisement so interesting and attractive that it will be read by a majority of the readers of the papers in which it appears regularly. That regular and not occasional advertising is what pays has repeatedly been proven by experience.

THE SELECTION OF MEDIUMS.

One word regarding mediums. The best paper for an advertiser to use is the one reaching the largest number of the class to which he appeals—not necessarily the paper of largest circulation. The cheapest paper is the one reaching the largest number of the class to which the advertiser appeals for the dollar invested. A wise advertiser will not advertise Plows in the paper circulating in the city, nor Plumbing Goods and Gas Fixtures in the paper of rural circulation. By keying advertisements one can readily determine the relative values of different papers for different classes of advertising, and can also tell which ones yield results and which ones do not.

SOME GENERAL REMARKS ON CASH AND CREDIT BUSINESS.

BY J. D. N.

TWO bills that were recently sent out from a retail store came to the writer's notice and reminded him of the same kind of bills that his boss used to send out. One of the bills referred to was for a Gun, Implements and Gun Case, upon which nothing had been paid since they were bought in October, 1901. The other bill was for a small balance on a Bicycle which had been sold on installments in May, 1901. On each of the bills was a courteous request to settle up, written in red ink, indicating there was blood in the retailer's eye.

SLACK METHODS.

Seeing these bills brought to mind old times, and I wondered if a word of caution regarding credit would be inappropriate at this time. During the past two or three years since times have been so good, money plenty and customers liberal in their purchases, many retail merchants have extended credit much more indiscriminately than they would have done in 1893, 1894, and under the conditions ruling they may be able to afford to do so. Perhaps some merchants have succeeded in keeping the amount on their books down to a safety level, but no doubt many more, in their feeling of security in good times, have exceeded a prudent limit.

A CHANGE.

While there are no surface indications of a reversal of the present business conditions, no sane person believes that this unparalleled prosperity will continue indefinitely. Would it not be wise to collect more closely and to extend credit less liberally so as to be in a safe condition when the tide changes?

"AND, PITY 'TIS, 'TIS TRUE."

There is a world of truth in the following, taken from *The Iron Age* of May 15, 1902:

Too much of the Hardwareman's hard, honest work is frittered away, in spite of sharpest watching, in the expense of keeping and carrying accounts, to say nothing of the final losses when he seeks to collect them.

This brings us to another phase of business. Some merchants are fitted to carry on a credit business, and some are not. Those who are the less fitted are usually the ones that have the largest proportion of their sales represented on their books. The merchant who cannot say "No" to an undesirable customer when he asks for credit, should conduct a strictly cash business. If he pursued this course he would hardly recognize the world as the one he had been living in.

WORRY.

The quotations to which reference has been made says nothing about the worry incident to a credit business. This is almost worse than the actual money loss sustained, as it undermines health, ruins the disposition and alienates even cash customers. But the weak man may not have the stamina or the disposition to do a strictly cash business. In some instances it may not be possible or desirable to conduct a business on this principle, but it is to be hoped that these instances are rare. It would certainly be easier to make a change in this direction during flush times than when money is scarce. The old saying, "If you can't be azy, be as azy as you can," might, with beneficial results, be paraphrased: If you can't do a cash business, do as nearly a cash business as you can.

JOBBERS' MARGINS.

THE communication in our last issue on the subject of protection to jobbers has called out the following letter, in which our correspondent, who has had long and prominent connection with large interests in the trade, makes the point that jobbers are in the habit of giving away more or less of the margin which is intended for their benefit, thus disturbing market values:

Referring to the percentage which is allowed the jobber over the retail or small dealer, I would say that I have had good opportunity to learn the mind of the manufacturers on this subject and have often heard the matter discussed at length during many years past.

It is certain that the majority of manufacturers are quite willing that the jobber should have a liberal margin of profit over the retailer or small dealer, but the reluctance to allow the same has grown out of the fact that the jobber does not retain the margin for his own benefit, and where he receives 10, 15 or 20 per cent. margin it is in most cases partly given away in competition with other jobbers, so that the manufacturer finds his own prices cut and the small trade almost entirely captured by the jobber.

Further than this, the jobber as a rule resents and resists every attempt made to compel him to maintain the manufacturer's prices.

If by some way the prices to the small dealer could be maintained by jobber and manufacturer alike there would be no trouble, I think, in the jobber securing ample margin for his profit.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

D. J. Marleau, Toledo, Ohio, dealer in Hardware, Agricultural Implements, Machinery, &c., requests copies of catalogues, price-lists, &c., especially from advertisers in *The Iron Age*. Mr. Marleau's method of filing trade literature, coupled with the use of "The Iron Age Directory," enables him, we are advised, to locate a catalogue instantly.

J. W. Shackelford, dealer in General Hardware, Water Valley, Miss., would be pleased to receive catalogues relating to Road Machinery.

Geo. B. Will has disposed of his Hardware business in Mendon, Mich., to W. A. Hossack, who has had nearly 15 years' experience in this line, formerly as clerk for Foster, Stevens & Co. and Gunn Hardware Company, and for the past three and one-half years as traveling salesman. Mr. Hossack is rearranging the store and will make a number of improvements in it. In our issue of the 17th inst. we were in error in giving Mr. Hossack's address as Grand Rapids. It should have been Mendon, as above.

ANNOUNCEMENT is made under date, 21st inst., that Louis Kruse, Charles Kruse, Geo. W. Kleinschmidt and Wm. Kruse, formerly of the Kruse & Bahlmann Hardware Company, and Otto L. Burger, formerly of the Bode Hardware Company, have formed a corporation under the State laws of Ohio under the name of the Kruse Hardware Company, with headquarters at 23-29 East Pearl street, Cincinnati. The new company, who will conduct a jobbing business in Hardware and kindred lines, have purchased the business of the Bode Hardware Company, Mr. Bode retiring to enter the Wagon manufacturing business, and Mr. Burger, the former junior partner, transferring his interest to the new concern.

NOTES ON FOREIGN TRADE.

BRITISH LETTER.

Office of *The Iron Age*, Hastings House, Norfolk St., London, W. C.

The Week's Hardware Trade.

THE change in the Premiership has not affected the money market in the slightest degree, and consequently business men are not conscious of any political change. The prevailing note this week is that the home trade at last experiences some benefit from the cessation of hostilities. Wealthy volunteers are coming back and are replenishing their domestic stock. For example, there has been quite a spurt in Carriage Lamps. Travelers, whose customers usually supply the wealthy country houses, are sending in good orders. The shooting season begins on August 12 and new Guns have been bought in good quantities. Another line of goods selling exceptionally well is Enameled Ware of nearly every description. I have repeatedly referred to Enameled Sign Plates. This trade continues to boom and it is a constant source of surprise to me that Americans with their special knowledge of advertising do not compete in this department. British shops have lagged behind American stores in bright multicolored Sign Plates. They are now waking up and American Sign manufacturers should certainly have something attractive to sell. War Office orders are being rapidly cleared off. Canteen goods, such as Tin Plate Ware, have been in brisk demand, but when there has been a breach of contract, particularly in regard to dates, the War Office is trying hard to be relieved of its obligations. Small Guns and Ammunition have ceased to be in military demand, and attention will now be paid to Sporting Guns and Ammunition. The Brass trades are moderately busy, employment being fairly regular. Some good orders in all departments have recently come from Ireland. The Cork Exhibition has had a distinctly stimulating effect upon trade in the South of Ireland. Those who have visited it tell me that it is unusually well arranged. The Wolverhampton Exhibition is still popular. Midland wholesalers are giving inducements to their customers to visit the exhibition. One large firm in Wolverhampton have cleared a large room for the use of Hardware visitors, lending the use of typewriters, note paper and other business conveniences. The Cutlery trade continues slack, particularly the home demand. Some good orders have recently come to hand for Celluloid Goods from British colonies. Oddly enough, Celluloid wears better in hot climates than Ivory, which one would assume to be the natural material for the Tropics. Next Tuesday the Ivory sales begin. About 80 tons are entered for sale. At Liverpool last week about 8½ tons were sold. Large tusks advanced £1 a cwt. and medium tusks £2 per cwt. There is considerable curiosity whether any American buyers will make their appearance. The following week the Antwerp sales begin, when between 70 and 80 tons will be offered. It is generally anticipated that prices will advance. The export trade remains about the same. There is some improvement in indents from South Africa, but the drought is having a depressing effect upon Australian orders. New Zealand trade continues good. British exporters have a practical monopoly of the New Zealand trade. Reverting to Australia, the *Ironmonger* calls attention to the position of the Hollow Ware trade out there. The provisional duty on Hollow Ware is fixed at 20 per cent. ad valorem. Previously, in most of the Australian colonies, Hollow Ware was on the free list. This duty, coupled with heavy freightage rates, is making it very difficult to do business. It is stated that the British steamship companies are considering the wisdom of reducing freight rates. For some time past not a single steamer from London has reached Australia with a full cargo, while many British houses are actually sending their Australian shipments to Hamburg via Hull, so as to gain the advantages offered by the German lines, particularly to Western and Southern Australia. Another source of embarrassment to British exporters is the loss of the Shelf Hardware trade with Canada, which now seems irrevocably in the hands of Americans. The same remark in a less degree applies to Cutlery. During the week good lines have been shipped to Japan and India.

Six Months of British Overseas Hardware Trade.

The past six months of the export Hardware trade have been on the whole a period of stagnation, with occasional spurts of activity. From one country or another from time to time have come large indents, which have made exporters hopeful of a continuance of the trade prosperity which we have experienced during the past four years. Then again, the constant rumors of peace in South Africa led to frequent little spurts, while finally, when peace seemed assured, there was a distinct export of all sorts of goods to South Africa on the expectation of an immediate demand. But there has not been that steady pressure of export trade, which is so acceptable to business men. Taking the result as a whole, the first six months of the year 1902 have not been quite so large in bulk as the first six months of 1901, nor have they proved as remunerative. Compared with the first half of the year 1900, both periods lag far behind. In 1900 the total value of metals and articles manufactured therefrom reached the huge total of £24,021,181, compared with £19,785,572 in 1901 and £19,589,683 in 1902. It will thus be seen that 1900 showed high water mark, and that since then the tendency is to decline. Had it not been for the declaration of peace in South Africa before the end of the half year the figures would have shown a much more unsatisfactory aspect than they do. Another feature of the half year's trade has been the marked tendency to buy various lines of metal goods in this country for American consumption. Not only in the heavy lines, but also in the more distinctively Hardware goods, has there been a distinct movement in this direction. The only exception is Cutlery.

British Hardware Imports.

Before dealing in more detail with British exports, a note or two on British Hardware imports may prove useful to American exporters. Illuminating petroleum is, of course, largely sold by Hardwaremen in this country. There has been quite an extraordinary reversal of a previous tendency to buy from Russia instead of from America. In the year 1900, for example, we were buying petroleum from Russia in the proportion of 37 to 55 from America, whereas during the first six months of this year the proportion has favored America in the ratio of 40 to 95.

Turning now to the importation of raw materials for manufacture, the following items show clearly enough the trend of the trade in the various branches affected:

	Six months ended June 30.			
	Quantities.		Value of imports.	
	1901.	1902.	1901.	1902.
Bristles, pounds	1,854,468	2,001,184	£250,716	£288,535
Caoutchouc, cwts.	240,863	234,714	3,190.324	2,937,358
Gutta percha, cwts.	39,013	51,311	612,638	695,389
Ivory, cwts.	4,356	5,394	158.720	199,115

And now I come to the purchases of manufactured articles, the figures of which are well worth careful study:

	Six months ended June 30.			
	Quantities.		Value of imports.	
	1901.	1902.	1901.	1902.
Brooms and Brushes, doz.	552,070	617,491	£137,780	£150,139
Chinaware or Porcelain and Earthenware, cwts.	201,645	178,311	470,588	466,309
Cutlery, cwts.	2,008	1,810	17,001	15,226
Cycles (other than Motor Cycles), number	....	9,397	....	56,153
Electrical Goods and Apparatus	....	....	552,966	355,411
Hardware (other than Cutlery), cwts.	154,191	229,414	503,353	656,326
Nails, Screws and Rivets, tons	....	21,573	....	267,360
Painters' colors and Pigments, unenumerated	....	....	632,225	633,647
Zinc manufactures, tons	10,781	10,946	246,797	248,221

British Hardware Exports.

As I have previously remarked, two distinct features mark the six months' exports of Hardware and Metal Goods—namely, increased purchases in America, and increased exports to South Africa. It will be observed from what follows that America has been buying in increased quantities in all the lines of goods, details of

which I hereunder give. The sales of Wire show a distinct all round improvement, the only notable exception being that of sales to Germany. The figures are as follows:

British Exports of Wire of Iron or Steel, and Manufactures Thereof (Except Telegraphic Wires).

	Six months ended June 30.			
	Quantities.		Value.	
	1901. Tons.	1902. Tons.	1901. £	1902. £
To Germany	911	829	31,563	27,812
United States	1,769	2,287	35,425	47,080
Brazil	207	277	5,906	5,563
Argentine Republic	2,208	3,112	26,046	34,780
British South Africa	1,912	3,936	30,587	59,305
British East Indies	1,466	1,789	36,811	30,658
Australia	3,626	5,122	76,256	96,371
New Zealand	2,392	3,001	38,223	47,948
Other countries	7,876	8,192	200,075	177,431
Totals	22,367	28,545	480,892	526,948

I have frequently referred in these columns to the large trade being done in galvanized sheets, and the following figures will show the exact countries where this trade is going strong. I remember four years ago, when in the United States, being shown a shipment of galvanized sheets to Australia. I was informed by the gentleman who showed it to me that this was the first shipment sent to that country. It certainly was among the very first, but since then Great Britain seems entirely to have recovered that trade, as will be seen hereunder:

British Exports of Galvanized Sheets.

	Six months ended June 30.			
	Quantities.		Value.	
	1901. Tons.	1902. Tons.	1901. £	1902. £
To Germany	2,822	2,294	35,518	27,797
Holland	530	346	6,652	4,073
Portugal, Azores and Madeira	436	657	5,127	7,609
Spain and Canaries	591	648	7,575	8,549
Dutch East Indies	1,850	3,257	23,263	42,145
Philippine Islands	1,690	1,469	21,448	19,525
Foreign West Indies	1,427	1,488	17,336	17,679
Mexico	2,379	3,574	29,124	42,790
Central America	794	1,150	10,466	13,732
Chile	4,428	1,704	50,023	18,569
Brazil	839	1,463	11,266	19,443
Uruguay	2,052	1,765	23,781	20,197
Argentine Republic	16,763	9,708	198,189	110,907
British South Africa	12,646	34,376	151,721	395,391
British East Indies	27,561	31,638	318,773	353,389
Australia	22,041	24,969	349,491	356,633
New Zealand	3,711	6,638	55,816	92,394
Canada	2,567	5,377	39,202	79,303
British West India Islands and Guiana	1,077	1,294	13,835	16,750
Other countries	15,527	26,705	197,954	330,856
Totals	121,731	160,520	1,566,560	1,977,787

The increased trade with America done by the South Wales tin plate manufacturers is still a feature of the market. It will be observed that but for this increased trade the South Wales makers would have done less trade than ever before, but when they export nearly $2,500,000 worth to America, compared with just over $1,500,000 the first six months of last year, it is evident they can afford temporarily to let other markets remain more or less unworked. The tin plate figures for the half year are as follows:

British Exports of Tin Plates and Sheets.

	Six months ended June 30.			
	Quantities.		Value.	
	1901. Tons.	1902. Tons.	1901. £	1902. £
To Russia	15,773	11,832	204,353	157,839
Germany	5,617	6,940	82,485	98,110
Holland	6,520	9,725	95,613	133,234
France	9,396	7,592	127,203	99,508
Portugal, Azores and Madeira	4,054	5,893	55,974	74,842
Italy	1,790	2,835	24,276	38,423
Roumania	1,808	3,045	23,768	39,548
United States	24,253	37,740	314,966	496,845
Brazil	1,809	2,771	25,182	38,717
Argentine Republic	2,014	2,708	27,338	36,366
British East Indies	13,910	11,722	195,522	169,217
Australia	6,998	9,335	102,809	130,941
New Zealand	1,130	1,471	17,060	22,252
Canada	6,830	9,010	97,311	131,670
Other countries	23,351	27,320	327,915	381,906
Totals	125,253	149,939	1,721,775	2,049,418

Hardware and Cutlery.

Cutlery shows the one exception to the general increase of goods sold to America. In this case there is a distinct decline, while at the same time there is a distinct increase in the trade done with Canada. It will be seen that there is a general weakening of the export Cutlery trade, but the unenumerated Hardware trade has advanced, due mainly to increased shipments to South Africa. A notable feature of the half year's Hardware trade is the distinct increase in trade done with the smaller and less well-known countries:

British Exports of Cutlery.

	Six months ended June 30.		
	Value.		
	1900.	1901.	1902.
To Russia	£1,697	£1,265	£1,472
Sweden	737	415	637
Norway	1,357	1,027	1,008
Germany	9,454	8,619	8,259
Holland	923	971	807
Belgium	2,787	1,566	1,501
France	3,292	1,624	961
Spain and Canaries	1,798	923	1,567
United States	38,534	39,385	34,042
Foreign West Indies	3,337	3,368	3,042
Chile	5,644	6,851	7,509
Brazil	16,157	14,351	12,841
Argentine Republic	10,575	10,674	8,089
British South Africa	21,177	40,196	60,587
British East Indies	23,414	29,573	27,128
Australia	79,962	69,720	56,704
New Zealand		14,865	13,972
Canada	27,848	21,866	29,434
Other countries	49,054	50,826	44,903
Totals	£297,747	£318,085	£314,463

Hardware, Unenumerated.

	Six months ended June 30.			
	Quantities.		Value.	
	1901. Cwts.	1902. Cwts.	1901. £	1902. £
To Russia	4,602	4,591	28,817	27,566
Sweden	2,014	2,003	12,176	12,795
Norway	1,886	1,803	11,071	10,715
Germany	9,242	9,401	53,670	54,539
Holland	8,312	8,123	48,083	49,231
Belgium	4,710	4,279	30,521	29,570
France	2,025	2,224	11,236	11,370
Spain and Canaries	1,934	2,447	7,198	10,537
United States	3,048	3,242	19,176	24,738
Foreign West Indies	2,882	1,643	11,741	7,192
Chile	2,216	2,055	11,104	9,483
Brazil	1,878	2,731	9,860	12,195
Argentine Republic	2,450	1,889	13,490	11,101
British South Africa	15,991	21,052	67,128	90,596
British East Indies	16,910	17,567	83,498	89,501
Australia	25,451	17,463	109,731	83,255
New Zealand	7,005	6,917	32,296	31,936
Canada	1,889	3,774	11,162	16,418
Other countries	29,621	36,613	138,661	160,464
Totals	144,066	149,817	710,619	743,202

The Metal Trades in Denmark.

The following analysis of metal imports into Denmark last year is worth study. It shows that Denmark can buy in goodly quantities, and as it has an extensive coast line the coast is clear (if I may venture on a pun) for American activity.

	Total imports. Cwts.	Consumed in the country. Cwts.
Pig Iron	722,800	664,600
Pig Steel	86,100	62,000
Black Plate	381,200	352,800
Tin Plate and Ironware	85,900	72,100
Rails	208,700	176,700
Cast Iron Pipes	340,400	317,500
Nails and Bolts	78,500	77,200
Coarse Cast and Forged Iron Goods	427,800	329,300
Hardware	86,100	81,200
Other Metal Goods	117,700	91,100

Travelers going to Denmark on business may perhaps be reminded that by making the proper representations through the American consul they can secure railway season tickets at an extremely low rate over the Government railway system. The rates are worth quoting:

	Available for			
	14 Days.	One month	Two months.	Three months.
Class II	$8.90	$17.72	$20.22	$26.94
Class III	6.40	8.06	12.15	15.98

As the Danish Government owns practically all the railways it is easy to get to every town of importance with these season tickets.

Metal Goods in Southern Russia.

Last year I drew the attention of American exporters to the action of Russian rural municipalities (Zemstro's) in purchasing Agricultural Machinery and Implements to enable peasants to obtain them on easy terms of payment. This movement is spreading and now sheet and bar iron can be obtained through the same channels. These Zemstro's naturally buy as much as possible from Russian manufacturers, but the supply is limited and accordingly the foreign goods have to be imported. Take for example roofing sheets. These are only made by two or three firms in Southern Russia, and the supply does not nearly meet the demand. Prices, too, are so high as positively to invite foreign competition. Thus, a few months ago a gentleman writing from the town of Ekaterinoslav stated that the price of Russian roof iron, delivered at the local railway depot, was $1.29 per 36 pounds, while Silesian roofing was $1.26. Obviously the Silesian accommodated his price to that of his Russian competitors. It is no wonder then if the Zemstro's must mainly rely on outside sources. This is clearly illustrated in the purchases of the Samara Zemstro. I give for a number of years the home and foreign purchases on Agricultural Machinery:

Manufactured by.	Value. 1895.	1896.	1897.	1898.	1899.	1900.
Russian factories	$11,000	$13,400	$16,500	$16,000	$36,000	$87,000
Foreign factories	20,000	23,000	50,000	51,000	71,000	107,000
Totals	$31,000	$35,400	$66,500	$67,000	$107,000	$194,000

It will thus be seen that two-thirds of these Agricultural Implements come from foreign countries, doubtless a certain proportion being from America. It is said that a majority of the municipalities of the other provinces of Russia buy in greater or less quantities. As there are 60 provinces in Russia and 11 in the Caucasus, it must be evident what an enormous trade is possible. As for prices, the terms usually offered by foreign manufacturers, when dealt with direct, are from 17 to 25 and sometimes 30 per cent. off catalogue prices, payments being stipulated for in two installments: Freight and duty (equal to about 25 per cent. of the price) are paid on receipt of goods, and the remainder in six or eight months, according to circumstances. There is every reason to suppose that if exporters can sell implements in large quantities they can also sell other metal goods. There are openings for Pumps, Cast Iron Rollers, Electrical Machinery and Apparatus, Copper, Sheet Lead, Pipes and Ingots, Aluminum, Mining Machinery and Tools, Files, Shovels, Coke Forks, Sewing Machines, Typewriters and Enameled Goods. There is generally a demand for Tool Steel, but the market just now is rather overstocked. Shipments by sea are not difficult. In Southern Russia the following ports are easily accessible: Odessa, Kertch, Berdiansk, Marinpol, Tagaurog and Rostoo on the Don. All these, except Odessa, are in the sea of Azov, and are the natural inlets to one of the most fertile areas in Russia.

R. R. MABIE ROOFING COMPANY.

OWING to the favorable opportunity for a largely increased business, R. R. Mabie, 154 Chambers street, New York, has incorporated the contract roofing branch of his business under the title R. R. Mabie Roofing Company, in accordance with the laws of New York State, with an authorized capital of $25,000. The company will make a specialty of Gravel, Slag, Asphalt and Tile Roofing, aiming particularly at many of the large contracts now in the market.

THE annual meeting of the Chapin-Stephens Company, Pine Meadow, Conn., and 80 Chambers street, New York, was held at Pine Meadow, July 16. The directors elected were: H. Wales Lines, Rufus E. Holmes, Charles M. Chapin, Hermon M. Chapin, Frank M. Chapin, Frank L. Stephens, Virgil P. Humason. The following officers were elected: Rufus E. Holmes, president; Hermon M. Chapin, vice-president; Virgil P. Humason, second vice-president; Frank M. Chapin, treasurer; Frank L. Stephens, secretary.

CONTENTS.

CATALOGUES AND TRAVELING SALESMEN.

BY C. A. B.

THE IRON AGE some months since referred to a plan by wholesale houses distributing goods through catalogues instead of traveling men, as something of an innovation. The plan mentioned contains the statement of approval and satisfaction as to results made by the adaptors. In what follows I propose giving the experience of a retailer with the two methods—viz., buying from traveling men and from catalogues.

Starting Business.

In 1896 I opened on a side street with a stock of Shelf Hardware, Kitchen Furnishings and Mixed Paints of $1200. The stock was bought from regular jobbing houses for cash, in the regular way. The sales for the first year were $3895.94, showing what is considered a healthy proportion of stock to sales. The second year showed an increase in sales, and in complaints from customers that my prices were too high. In marking goods I followed the rule learned from several years' clerking for different retail stores to add 50 per cent. cost of an article to get the selling price; Hatchets that cost $4 per dozen I marked 50 cents each.

Investigating Prices.

The third year my sales fell below those of the second, though still bearing the conventional relation of sales to stock. There was no falling off in complaints that my prices were high. I investigated prices of my competitors in the regular Hardware lines and found little, if any, difference between their prices and mine. As comparisons were generally made with department stores I felt easier, but determined to get nearer the department store prices if possible. When my good friends, the traveling men, came along I told them the situation. Said one, "What you want to do is to buy an entire line of Steelchain Company's special brand right through and have something the department stores won't have," showing how I could save 5 per cent. by buying Hatchets in five dozen lots. I accepted an invitation from him to take dinner at the hotel at his expense and look over his line, and of course I bought a bill of goods.

New Light.

The same day the invoice came from his house a friend of mine in the same business came up from the little country town where we were raised. He showed me a catalogue containing cuts and net prices. We took Steelchain's invoice and made comparisons with the catalogue, the result being I wrote for a catalogue at once, my friend remarking he believed he had earned his dinner when he showed me that catalogue.

Encouraging Results.

A few months after buying from catalogue my customers remarked that prices must be coming down, my prices were so much lower. Sales increased and the need was felt for more room. I moved over on the main street, paid two and a half times former rent and the fourth year sales were nearly doubled.

A Buying Governor.

This brought about a change of base from my friends, the traveling salesmen. Concessions were made as to freight. Frequent references on my part to the catalogue with prices printed net jarred my friends considerably, and their quotations were given cautiously. I don't accept as many invitations to dinner with salesmen as formerly, but when I do inspect a line at the hotels I carry with me my prices printed net. I am in a territory that is admitted by traveling men to be worked closer than any on their route. The biggest jobbers in the country fight for this trade and we get what concessions are going. Nevertheless I have gained more by my "prices printed net" than from jobbers' competition.

Increasing in Number.

These catalogues now come from firms selling strictly Hardware, from firms handling auction goods and from those selling under one roof all kinds of merchandise. The most satisfactory catalogue comes once a month with prices guaranteed for that month. Nearly every article is illustrated and there is no misrepresentation, no fakes, no time accounts, straight business right through for cash.

Advantages.

In making up an order a buyer is not hurried; he may buy a dozen as cheaply as five dozen. He may buy little and often, get new goods when people want them and at the price. A judicious use of both traveling men and catalogues printed net puts him in a better position to meet department store methods and rocket store competition.

Below I give a table showing sales since starting in business:

Goods Bought from Salesmen Only.	
1896	$3,895.94
1897	4,604.25
1898	4,393.28
Goods Bought from Catalogue and Salesmen.	
1899	$7,453.86
1900	9,484.13
1901	11,584.33

No single condition or ability makes for business success. A first-class window trimmer is not always a good manager. I would not like to say the increase in 1901 came from using catalogues, but together with other conditions it helped mightily.

STORM, WAITT & CO.'S CATALOGUE.

The accompanying cut is a reproduction of a page, reduced in size, of a catalogue issued by the retail Hardware firm of Storm, Waitt & Co., Lebanon, Ind. The book is about 4½ x 6 inches in size, containing 24 pages.

Storm, Waitt & Co.'s Catalogue.

Among other goods illustrated and described are Wagons, Stoves, Wire Fencing, Cream Separators, Freezers, &c. There are a number of blank pages upon which farmers can make memoranda. We are advised that the book was gotten up without any expense to the firm, as the different manufacturers whose goods are handled exclusively by the firm, bore their proportion of the expense. The following are extracts from the introductory page: "In presenting you with this illustrated catalogue we do so with a deep feeling of gratitude toward you, because we feel that you have contributed quite generously of your patronage, which has made the past year one of prosperity for us. . . . It is our policy to keep nothing in stock that is not up to date, and the very best of its kind so far as our knowledge and experience will allow us to judge." Three thousand of the catalogues were distributed by the firm.

The Hardware Situation and Outlook.

The following review of the situation as seen by Hardware merchants reflects existing conditions in every State and Territory and affords an admirable basis for an intelligent judgment as to the prospects for business during the remainder of the year. The letters thus given are from representative Hardware merchants, who in view of their position, ability and intelligence, and their close contact with the consuming public, are exceptionally qualified to give conservative, unbiased and accurate reports. The almost uniformly hopeful feeling which pervades the communications cannot fail to impress itself upon those who study this remarkable portrayal of trade conditions:

NEW ENGLAND STATES.

The following reports show that in the New England States the volume of business for the past six months has been very satisfactory, and in most cases better than in 1901. Merchants generally feel the effect of the activity which has prevailed with manufacturers. Local influences have in some places interfered with trade. Traces are found here and there of the effect of high prices in the way of restraining purchases, but the outlook, on the whole, reflects the general prosperity and promises a large volume of business.

MAINE.

Trade has been very good, and especially so for building materials, on account of the rebuilding since our fire. Stocks are very good, and the farmers having received large prices for their crops are spending the money quite freely building and repairing. The people here for the past two years have been very prosperous. Good crops and good prices have made them flush and they have paid their bills more promptly than usual, and have paid up many of the mortgages on their farms and are getting generally out of debt. Many new buildings are being built, many repairs are being made and an air of general prosperity abounds. Collections have been better than usual and we hope will continue so.

Trade has been very good with us the first six months of this year. Demand slightly larger than last year. We have carried a larger stock and in that way have been better situated for filling orders promptly. Our experience is that the average dealer does not place his order until after he has wanted the goods for a short time, and then he is in a very great hurry. Stocks are in normal condition, no one that we know of being overstocked. Collections are very hard, more so than for 12 months, and we do not know of any good reason for it. For the remainder of the year, barring strikes of laborers, we shall expect a fairly good business. The financial condition of the farmers must be better than for many years, and especially is this true in the northeastern part of the State. The amount of building is very much limited in our immediate vicinity, although we hear of contemplated projects that will require considerable capital.

Increased demand, good crops and farmers generally prosperous, heavy timber cut and active pulp mill business. Hindrances have been strikes and difficulty in getting goods. Stocks are heavy, improvement in collections, people are prosperous. There is difficulty in finding laborers, especially for contract work, very little building on account of carpenters' and plumbers' strikes. If labor troubles were settled the outlook for a large volume of business this year would be good.

Trade has been very good the past six months. Stock is now light and collections are fair. Indications now for fall trade are good.

Demand for goods has been fair. Heavy and continuous rains have affected the crop prospects, except hay, which is above the average. Stocks generally are not large. Collections unusually slow. Business prospects good, as the majority of people are prosperous. Labor well employed at satisfactory wages. Financial condition of farmers has not been so good for years. Not many new buildings are being built in the section, except fine cottages on the islands about Penobscot Bay and the main land; also about the lakes.

Business has been very good indeed. Present indications point to a decided falling off for balance of season. Our business is controlled entirely by supply of sardines, and up to present the catch is a failure. The fish should have put in an appearance, in quantity, one month ago. Everything depends upon the catch.

Building not over one-half what it should be. High price of labor and material have affected business materially. Stocks are about as usual. Collections are very good. Financial condition of the farmers is very good and people generally are fairly prosperous.

About 25 per cent. increase in business. We have experienced difficulty in getting goods. Stocks are heavy and collections fair. Indications are first-class.

NEW HAMPSHIRE.

Trade is good, about as last year. Bicycle trade has fallen off considerably; their use for pleasure riding, except for young people, seems to have gone by. Not much difference in General Hardware, Agricultural and Mechanics' Tools from past year or two. It looks as though trade the balance of the year would be good. Factories of all kinds are running full time here. Labor is fully employed. Farmers' crops are good and they are prosperous. Considerable building here. Money is plentiful. Collections good. Cash sales are large. The only trouble with trade is the sharp competition of one sort or another and the increased cost of doing business. The decrease in rate of profits and increase in expense are about equal, which does not work satisfactorily.

Demand below that of other years. Collections are good. Quite a lot of city people from around Boston are fixing up their homes and using quite a lot of Hardware, which is ordered from their city homes to a great extent, but taking it as a whole a great deal of merchandise is being consumed. The latter part of the year will show good results. Labor is fully employed. The farmers are having good crops and are in good financial condition.

Sales of Hardware in this section have been in good volume—in the case of many articles larger than in years past. Stocks in store and ordered are good, but much difficulty is still experienced in getting some kinds of goods promptly from makers. Collections are fair.

Demand about same as last year. Stocks here are about medium. Collections are very good. Business promises well for the future. People seem prosperous. Labor is well employed and satisfied. Farmers have good crops and are in good condition. A good deal of building is going on.

Since April 1 business has been very good with us and throughout the city. We need some new industries to enable us to do more building. Collections have been a little slow, but have improved the past three months. The prospects for the last half of the year are very good.

A normal business, handicapped somewhat in getting goods from manufacturers. Summer stocks rather heavy on account of cool weather. Collections good. People seem to have money to spend and buy better grade of goods. Labor all employed. Farmers getting good prices. Building operations good, considering high prices and local high rate of taxes. Bicycle business about 25 per cent. of usual amount. Trolley car service and other forms of amusement have affected bicycle riding for pleasure adversely.

Demand has been better than in 1901. Stocks are rather low, owing to slow shipment by manufacturers. Collections very good, better than last year. Prospects not so bright as six months ago. Season very cold and backward and bad for all crops except hay. Very little building in this section.

VERMONT.

The demand for Heavy Hardware, contractors' supplies and construction material has been exceptionally heavy this year owing to new dam and street railway construction locally. Stock on hand is a little heavier than usual. The farmers have also been buying more than usual of Implements, Building Material, Carriages and Harness. Continued cold and rainy weather had a bad effect upon the sale of

Paint and Screen Doors and Windows. Collections fair. The people seem to be prosperous and fully employed, although local strikes among the machinists here have interfered somewhat with this desirable condition. The farmers are in good financial condition, although crops are backward. There is no exceptional activity in the building trades.

Owing to the near completion of heavy construction work we expect merely normal conditions in that line this fall. Farmers' trade ought to continue good. There ought to be a good demand for Painters' Supplies this fall if weather is good.

Business in General Hardware, plumbing and heating is good. The demand for goods in these lines is even better than in 1901. The Slate business, which is our principal industry, is in a prosperous condition. Farmers' crops are generally good. Excessive rains and muddy roads are the principal drawbacks to business, at the present writing. Stocks are being well kept up and collections are fair. We look for a good business for the remainder of 1902. General prosperity seems to be in the atmosphere and labor is well employed. Farmers are obtaining good prices for their products and are generally prosperous. Not much in new building is being done in this section, business in this line being mostly confined to general repairs and improvements.

Our business has been better than usual the first six months, but now we are feeling the effect of unseasonable weather, strikes and high prices in provisions. We think the fall trade will be good. The farmers are having a prosperous time.

MASSACHUSETTS.

The volume of business for first half of 1902 has been considerably in excess of same period of 1901, particularly on Farming Tools, Sporting Goods and Mill Supplies, with a falling off in demand for Builders' Hardware, caused by a strike in April of plumbers and painters for an eight-hour day at nine-hour wages. Stocks, we should say, were larger than usual, as would naturally be the case. Collections have been fair. The mills are running full time, with generous pay rolls, and there is an unmistakable air of prosperity among the people.

Summer business among the hotels and boarding houses is not up to usual standard, and as noted above, building operations have so far been quiet, but indications point to increased activity and there seems no doubt that 1902 will be a banner year in this section. Plans are now being laid for new buildings and an increased output by several mills. The building of trolley roads goes on rapidly, and the future seems encouraging to the business community. A gratifying increase in the deposits in our savings banks and a growing demand for loans on real estate to build homes are noted.

Demand better than usual. Spring trade stronger than for the past two years, one reason for which is that consumers have reached a point where they must buy despite high prices. Stocks fair; collections fair. We expect a fair trade for balance of the season. People are well employed. Condition of farming about average. Building repairs better than usual, but new building is light. Crops are late; in fact, it is early to make an estimate on them, for much will depend upon the weather for the next six weeks.

Thus far this year the demand for our class of goods has been somewhat greater than last year. The prosperous condition of the cotton cloth industry in this section (upon which all branches of business here depend) is the cause of the general activity in business. Collections have been very good. The people as a rule are prosperous. As some new mills are being erected in this section and others are enlarging their plants, it would seem as though we might reasonably expect a good business during the whole year. Good labor is fully employed.

Trade has been very good—perhaps a little better than last year. Stocks not large. Collections fair. The outlook for the remainder of the year is fair. The people are in a fairly prosperous condition. All labor is very well employed. The farmers are prosperous. Building is rather light. People have not got accustomed to high price of lumber and eight hours for carpenters. This applies to the average man, not to the bankers and brokers who are worth millions. They are spending vast sums building and improving their estates.

Our business has been A1 for the first six months, particularly in Farming Implements and Paints and Oils, and money seems to be easy. We are looking for a good fall trade. Our stock has been closed out in good shape in seasonable goods. Factories are quite busy now and nearly every one is employed that desires work. Farmers are fairly well to do this season and crops are looking well. We are looking for some building this fall.

Our trade has been better than the first half of 1901. Factories in this vicinity running pretty full and help well employed. Season very backward and trade in seasonable goods slow. Collections fair. Stocks a little above the average.

People generally prosperous, outside of the farmers. With the latter their crops in this section were not as profitable last year as they have been the past few years. Labor well employed. Building in this immediate vicinity lighter than usual. The outlook is first rate for a very successful business year in this locality.

Our trade has been good, in fact, rushing, up to the present month, which, as usual, has been lighter. Our people have been busy and shoe business is good, which makes good business generally. The building trades have plenty of work, but have been bothered much by strikes and unions. Our stock is, as usual, light on seasonable goods, but generally as heavy as at any time. Collections have been good.

The balance of the year we think will show good business, as our factories are all fairly busy and will become more so as the season advances. Crops in many instances are light, but the hay crop seems to be fully up to the standard, and to all appearances the farmer can show a balance on the right side.

Trade is off this season. The cold, dry spring hurt the seed business. Hardware has been slow coming. Leather business quiet, shops only partly filled. Hardware stocks are normal. Collections hard. Building quiet, but many old places being improved.

RHODE ISLAND.

The first four months of this year trade was very good, though most Hardware was being used in a jobbing way, there being but little building. The next two months, owing, we have thought, to strikes and extreme advances in price of Hardware and the high prices of building materials generally, have brought what promised to be a big six months' business down to the average. We, in common with most other houses dealing for the most part directly with manufacturers, have suffered more or less for want of goods. Until the last advance we had been buying liberally and had a larger stock than usual, but since then have bought for needs only and are using our stock. Collections have been better than since 1892. We are situated in a farming country, the farmers have, for the most part, large crops, and have been getting good prices for their truck, and it is only natural for us to look for a busy fall. Some little building is being talked of, more than for the past six months. Generally speaking, the working class are more generally employed and at better wages than for several years.

Competition growing every month. Enough goods sold, as we are in a large manufacturing center, but prices very unsatisfactory. We have had a good trade, better than a year ago, and collections are good. The (so called) jobbers frequently sell to consumers as low as they will to dealers, which is also a bother. Everything bright and prosperous.

Larger demand in all lines. Stocks light in lines of summer goods. Collections better than in some years. Indications are for a good trade through the year. Labor is well employed. Farmers doing well. More building than last year. Think there is more cash business and less credit than in former years.

Trade has been generally good since March 1. Large advance over 1901. Demand good. Less argument on prices. Weather has much to do with Implement business. The cold, dry season hindered crops and trade felt timid. Then the wet came that relieved this and a lull due to too much wet. Abundant crops and small prices. Stocks about the same as usual, well cleaned out on seasonable goods. Collections especially good in June, a little quiet just at this time. Farmers are in much better financial condition than three years ago, yet they feel the high price of grain and think their crops too low. Their crops are largely garden produce and potatoes for the Boston market. Potatoes at $1.50 per barrel, cabbage 35 cents, &c., yet they get at retail 7 cents per quart for milk. Carpenters are all well employed. A fair lot of building for the time of year. Think prospects are as good as common.

CONNECTICUT.

The demand for goods all through our lines, except Carpenters' Tools and House Trimmings, has exceeded last year. Trade in Tools and House Trimmings has been seriously affected by a strike of the carpenters for about two months, beginning May 1, and also by a strike of some weeks of 300 to 400 men at one of our leading factories. We have also been seriously delayed in shipping goods, because

manufacturers have never been so slow, within our experience, in filling orders.

Indications for fall trade good. Labor appears to be well employed. The farmers generally are in good condition financially. Much, however, depends upon their getting good prices for their tobacco crop. Owing to the carpenters' strike few new buildings, compared with previous years, are being planned or erected.

We have locally been unfortunate in having a carpenters' and masons' strike, which came on in the best part of the spring, and has affected the building trade, and we think all other business, as unions in all lines of business seem to be holding back and not spending money, thinking they might be called upon to help the other branches of trade. We must confess that department stores, 5 and 10 cent stores and catalogue houses do interfere more and more with the legitimate Hardware trade. Stocks are about as usual. Collections. are fair.

Trade for the first half of the year has been very strong, but the margin of profit has been small, due to the disposition on the part of jobbers to cut prices where the necessity for it does not exist. The demand for all kinds of Hardware and Mill Supplies is fully equal to last year. The one menace we see to present conditions is labor agitation. Stocks in our section are normal and collections are fair. The outlook for the balance of the year, as we see it, is bright. Factories all running full time; plenty of orders ahead. Labor well employed, and no good man need be idle.

Our own business is better the past spring than in many years. The larger increases come from farming sections and supplies for factories. Builders' Hardware does not show increase, owing to the high price of material and labor, which has had a serious effect, especially in the cheaper class of buildings for investment. Stocks are of a medium character, with a tendency to run light from now on. Collections have been exceptionally good for the past three or four months. Prosperity is good, as there are very few, if any, unemployed. Building for investment is very light.

The first half of 1902 satisfactory; more goods sold than last year. The general prosperity of the country has made demand for goods. In our opinion, the only hindrance to trade is the general unrest among labor. Leaders in labor unions are always active in good times, and fear of the future keeps manufacturers from accumulating goods at high prices for material, coal, &c. Stocks are not heavy. Collections fair. Savings bank deposits are increasing and people are spending money freely. Labor is fully employed. Building is active. Manufacturers are increasing their plants, and the demand for tenements exceeds the supply. We feel, however, that merchants should begin to look very carefully after "credits," as when business is so active contractors are very anxious to take all of the work in sight, and to try to do more business than their capital will handle.

It is our belief that there is a lessened demand, and that business is injuriously affected by too much combination in both capital and labor. While we are of the opinion that some of the apparent prosperity is, after all, of a doubtful character, it is true that all labor in our territory is employed, and the financial condition of the farmer is good. It is likewise true that there are new enterprises in fair volume; mostly for business purposes.

Our business for the first half of 1902 will compare favorably with the same period of 1901. While the volume has been larger, we attribute it to the larger stock we are carrying in our new store and improved facilities for handling business, which on the whole has been very satisfactory. We have been afflicted with labor troubles, which, with the trouble experienced in getting orders filled for Builders' Hardware and Trimmings, has probably curtailed our Builders' Hardware trade 50 per cent. Collections are better, if anything, than for the year past.

Business generally has been better this season than for many years. Although there has not been much building in this city there has been quite a demand for goods in other departments, especially in Seeds and Fertilizers. Although the hay crop is rather below the average the balance of the crops are looking fine, and many of the farmers have put in fodder corn, millet and Hungarian to make up the shortage in the hay crop.

Demand is better than for three years previous. Open air tobacco is being replaced by tent tobacco grown by large syndicates and the heavier farmers. Business improved in consequence. Stocks are generally heavy and collections good. Farmers doing well, I think. Hay and potatoes only light crops; tobacco promises well. Demand for labor such that every one finds work. Building heavy, but confined mostly to tobacco barns.

The demand is about 5 per cent. less than in 1901. Our business has been affected by labor troubles. We are carrying an average stock, heaviest in Iron and Steel Goods. Collections were very bad early in the year; now better. The prosperity of the people is excellent. Mills and factories are fully occupied. Farmers' financial condition is good, but they do not always realize it. Building operations are light, and new enterprises are checked by the existence of labor uncertainties.

Trade has been much better with us this spring than for a number of years. We carry a medium stock; collections are fair. Indications for the balance of the year are favorable. Factories are running full; crops are good, with quite a little building going on.

The demand for goods equals that for the same period in 1901, which was quite good. Our farmers had a rather poor season last year. Our factories are busy. Competition from manufacturers is severe. Stocks heavy and collections fairly good. Building is very light here and farmers are not particularly prosperous, but the prospects are fairly good, as factories promise to be busy and people to have money and be steadily employed.

MIDDLE STATES.

Business in this section of the country, which includes the great manufacturing States of New York and Pennsylvania, is reported generally as having been excellent during the first half of the year, the only important discordant note being in Pennsylvania, where the coal strike has materially affected trade in a number of localities. A confident feeling is generally indicated as to the future course of things.

NEW YORK.

The volume of business has been ahead of any other year. Trade has run largely to Heavy Hardware. I have noticed a perceptible falling off on small goods, especially House Furnishing Goods. I believe trade in this line is running to the department stores, and many of our farmer friends are sending to catalogue houses for smaller items. In my opinion, the stocks of Builders' Hardware on hand would average light. Collections good.

Demand fully equal to former years, in some lines greater. Have suffered and lost some trade because manufacturers have been slow in filling orders, especially on staple and season goods. I think stocks in retailers' hands about normal; collections have been fairly good. With us prospects are good, our manufacturers are all running full time and full force with good orders ahead. Farmers are prosperous, with good crops and good prices, and are buying freely. Building in this city is the largest for several years, but largely in public buildings and residences.

Trade in this section compares very favorably with that of several years previous. We have had cold and backward spring, but crops are now looking well, and the outlook is very favorable for good crops. Most merchants have put in good stocks of goods, and are looking forward to a fair trade this summer and fall. Collections have been slow, but are seemingly improving. The people in general are in good spirits, and labor is fully employed in this section. Farmers have been favored with good prices for their products, and, as a whole, they are in better condition than they have been for a number of years. Considerable building and repairing is being done.

Demand for goods by farming community not as brisk as usual, owing to short crops last fall, obliging a great many to buy feed who formerly were in position to sell, causing a great many to feel they must get along with their old Tools. A great many who must have some goods were obliged to ask credit, thus causing trade to feel the delay. One great hindrance to trade also is with the merchant who is disposed to cut his price a little below the other fellow, thinking to get the trade, and causing customers to go shoping. Stocks of goods I imagine to be light, as it has been very difficult to obtain goods from manufacturers. Collections rather slow, but hope in the fall they may be better.

The general feeling through the country is that we are to have good crops, and fair price may rule, causing a feeling of buoyancy generally through the country. Laborers who are willing to work can find full employment and first-class wages. Farmers are generally in good condition and feeling fine. The heavy rains have had a depressing effect, but a few days' sunshine will bring all around again.

The demand has not been as good as last year, as the weather has been cold and rainy for several months. Aside from the poor crops the farmers are raising and the loss of trade from them our business has been good. Our stock is complete, and heavier than last year. Collections are good.

Our people, as a general thing, are very prosperous, and all who will work have all they can do at good wages. The financial condition of the farmer, on the whole, shows a strong improvement over last year.

Trade during the first half of 1902 has been active, well distributed through the various lines, and about 20 per cent. more in volume than for the corresponding period of 1901. Buying has been checked by the excessive rainfall of the past few weeks, and fall trade will be affected largely, as farmers have sustained some heavy losses. The laboring classes were never so well employed, but the cost of living leaves but little for anything besides necessities.

Best first half year we ever had. Demand very good. Have been very fortunate in getting goods needed. Stock fairly good. Too early to judge of collections. Our customers seem in fairly good condition; labor very hard to get in any line. Believe farmers will have good year; average amount of building repairing. Think that prospects are good for trade the last half of year.

Our individual trade for first half of 1902 averaged above 10 per cent. better than 1901. There is more building going on in this locality than at any time before in the past ten years. Our farmers are in fairly good shape. Collections are above normal. Think stocks of goods are rather low, especially Wire and Nails. In common with the rest of the country we are suffering from extreme hot weather, in consequence most farm crops are backward and unless there is a decided change for the better soon, some crops will be almost a total failure, which, of course, will affect trade very seriously. Labor is well employed and scarce, especially in the building lines.

Demand about the same as in 1901. In Field Fencing an increase of 100 per cent. Stocks are about the same. Collections slower than usual. Continual rains and cold weather have lessened trade in Rubber Hose, Freezers, Hammocks and Screen Doors and all summer goods. People are prosperous except farmers, who complain of the wet weather. City laborers are all busy. Carpenters, masons and tinners are in demand with us. All are at work. Farmers pay as they go, and ask for less credit than formerly. Plenty of building to keep all our artisans at work in all lines.

Our trade for the first half of 1902 is ahead of any other year, although the fact that our farmers are cutting the lightest hay crop in years has made the trade on Haying Tools very light. And our inability to get goods promptly has lost us some business. Our stock is above the average, and collections are just fair. Owing to the high price of feed for the past six months the farmers are behind, but with cheese bringing the best price it has in years, the prospects are good for collections later. Prospects are good for plumbing and other work for tinners and plumbers. The large acreage of corn for ensilage will make a good demand for Silo Hoops. Labor is fully employed, and the farmers are in the best financial condition for some time. There has been more than an average of new building this season.

We cannot see much improvement in trade over former years. Backward season and rainy weather. Stocks in good shape, about as usual. Collections fairly good. Majority of farmers prosperous. Not much building and no new enterprises.

The demand for goods by farmers is lighter this year. The high price of feed and low price of hops have affected business. Also a general feeling of dislike to trusts. Stocks are rather heavy. Collections among farmers are not good. The continued high prices of farm produce will bring more prosperity, as already there is more hope in the future. There is a scarcity of farm help, and wages are good.

Our trade since January 1 has barely equaled 1900 or 1901, and had it not been for local and temporary causes it would be quite slow. We make it a rule to keep stock up to the standard, being fully convinced we cannot sell goods if not in stock. Collections are fairly good, and we think as favorable as 1901. Our town is only fairly prosperous. Labor is quite well employed. The farmers are getting quite large productions and good prices for their products, their greatest embarrassment being to procure farm labor and the high price they are compelled to pay for same. Building with us is limited, and at present new enterprises are scarcely entertained. We are frank to say we can see no great encouragement for balance of the year.

The demand for goods shows a slight increase over previous years. An early spring gave an impetus to business that is rarely experienced in this locality, and which continued throughout spring and early summer, only being hindered to a small extent by the large amount of rain. Our stock is being kept up only to meet the demands of our trade. Large buying only resorted to when too much difference is found in the hand to mouth policy. Very little, if any, of the speculative. Collections not up to the apparent general prosperity of our locality. No better than years of less prosperity. Labor is fully employed, some manufacturers finding difficulty in obtaining proper help. Condition of the farmers contiguous to our city is about the same from year to year—poor, with but few exceptions. More building going on than for some years past.

NEW JERSEY.

Our trade for the first three months of this year was not up to last, but we have been going ahead in sales since. The demand for goods is keeping up. In July we rather look for a dull time, while the farmers are busy with their harvests, but in this we have been disappointed. We keep our stock full the year around. Collections are very slow, but most of our customers pay cash; this is the best of all. The granger and catalogue houses cut ice all summer in this county. Our farmers never had more money than at this time. It is hard to find a man to work, help is very scarce. Very few new buildings are going up. The outlook for peaches is encouraging. We confidently expect a good fall trade, everything points to it. When the farmers don't kick you can make up your mind they are in clover.

Trade seems to have been very good considering the various strikes throughout the country among the masons and carpenters, and the stocks at present are more or less heavy. Collections seem to be very good at present. My opinion is that the times will be more prosperous since the financial condition of the farmers is better and there is good outlook for building. Certainly the present condition and future outlook are very good.

Demand for factory supplies has been greater than ever before. Stocks are somewhat lighter on account of demand. Collections good, except in some cases when some customers seem to be letting their bills run behind to invest in stocks and trust companies, &c. Prosperity of people never greater. Anybody who actually wants work can get it. Buildings for factory use are being erected in large numbers. Buildings for homes slacking off. Buildings for profit, such as flats, &c., nearly stopped, on account of high prices for labor and material. Real estate is not real any more. People want something they can turn over quick. Two years more and the greatest crash the world has even seen (on account of fictitious values put in many enterprises) will take place.

Demand only fair; trade considerably interfered with because of labor agitations and strikes and the difficulty of getting goods promptly. Collections poor. Business through balance of year will likely be very quiet.

The volume of trade was considerably larger than usual, and prices were higher. We have been bothered somewhat by difficulty in getting goods promptly. Stocks are about normal. Collections are good, better than usual. People are generally prosperous. Labor fully employed. Crops are looking firm. Prospects for fall trade are good.

PENNSYLVANIA.

The demand is quite as good, and in some lines better than other years. Inability to obtain goods promptly from factories has retarded business. Stocks considered light, and seasonable goods well cleaned up. Collections are fairly good; this item could always be improved upon. Indications appear favorable for fall. Everybody should be prosperous, as there is no lack of employment and at good wages. Farmers said to be in good shape, and getting good price for their products. There are large building operations going on here and in contemplation, but scarcity of structural steel has held up operation. Contractors say labor alone is 35 per cent. higher than five years ago.

The demand, as compared with other years, has been better. Stocks are heavy and collections fair. The people are prospering, and you cannot hire a man for weeks sometimes. The farmers are financially in good condition, and there is about a third of the usual volume of building and new enterprises. So far the coal strike has not affected us, as we live in a soft coal region. Logs that we did not expect came in during the late freshets. Our trade has been better this year than since 1889.

This is our one hundred and fourth year in business, and the spring trade was the largest we ever had. We might have done more could we have had our goods shipped more promptly. The only hindrance we had this spring was a strike of carpenters and mill hands, but all is settled at the present time. Collections are fairly good, but not as prompt as they should be in these prosperous times. The outlook for the remainder of the year is far from bright in some localities, as the coal strike is being felt very much. Storekeepers, tin, stove and coach makers are all afraid to invest, as no one can tell when the end may come. Most of our farmers should be happy, as the only crop that was poor was hay. Corn is

very promising and should yield a large crop. There are 300 to 400 houses in course of erection, which will be occupied as soon as finished. All factories are running full time, and there is very little or no stock on hand.

All kinds of Hardware in large demand. The erection of large buildings has favorably influenced business. The coal and silk strikes have retarded trade. Stocks are heavy and collections ordinary. The general condition of the people is good, and there is more work than men to do it. Farmers' financial condition is exceedingly good. The coal strikes are affecting all classes of business and have shut down some of our best enterprises.

Our business is slightly increased over previous years. The demand for Building Hardware is greater. Unseasonable weather has affected business somewhat, and there has been difficulty in getting goods promptly. Stocks are heavy; collections fair. People here are fairly prosperous; labor is fully employed, but the farmers' condition is nothing extra. There is a good deal of building, but trouble in getting material.

Trade was very good up to May 15, the demand being about the same as in the spring of 1901. Miners' strike went into effect here about that time and shut off business almost 50 per cent. Collections are slow, and stocks about normal. About one-third of our striking miners are working on public works, roads, sewers, &c. Very few buildings are going up. If strike is settled soon we will have plenty of business for the balance of the year. Had we escaped the strike this would have been an unusually good year in this section.

The prospects for the year seemed excellent at the commencement. Many new buildings were in course of construction, and architects reported many plans in their offices. The strike among the anthracite miners has curtailed business a great deal. Local jobbers were quite well prepared for this, we believe, and purchased less for spring and summer trade than usual. Our customers outside the coal regions report trade very fair, although the cold, damp weather during June and the early part of this month has shortened sales of seasonable goods. Except in the coal regions and among those dependent on trade from the miners, collections are quite good. Banks in the smaller towns report deposits above the average.

Business in general has been very good for the first half of 1902. The demand for Builders' Hardware and Painters' Materials has been exceptionally good, caused by the building now going on. Stocks now in most cases are about medium; collections, as a rule, quite good. We expect to have a busy fall on account of the new buildings going up.

Our Hardware trade is not up to last year, owing to fewer small houses going up. Our plumbing and hot water and steam heating work is very satisfactory. Stocks are about as usual, but collections are slow. Indications are that glass making plants will resume early. Think business is good for the balance of the year.

Trade has been good, stocks are moderate in quantity, and collections are satisfactory. Labor is well employed at good wages; farmers are well to do; building operations are active and future prospects are bright.

In this territory business was better up to the time of the coal strike, and if it had not been for that business would have been better than for years. Stocks on hand are considered good. Collections also have been good. If there are no further labor troubles we consider the prospects good.

Trade has been fair; purchases mostly for immediate use. Some were a little scared at the drought, asserting that farmers were purchasing less in consequence. Factories have been slow in filling orders, and they were oversold. Prospects are good, stores are busy, usually at night and Saturday evening especially. Coachmakers, saddlers, &c., are busy on orders.

There is a fair demand for goods. Sales were restricted somewhat by inability of jobbers and manufacturers to fill orders, and then again by the unusually cold season, which has lessened the demand for hot weather goods. Labor is all employed, and collections fair. Crops are fair, but farmers are greatly inconvenienced in harvesting by the excessive rains.

The demand for goods of all classes as compared with other years is much stronger, and while the volume of business transacted is greater, considered from a financial point, the profits are not as large as when goods were bought lower. Our stocks at present are rather heavy, as we are compelled in many cases to purchase quantities to get the price. Our collections are not as good as they should be, but this is on account of contractors not being able to get prompt deliveries on material, or labor enough to finish contracts and get the same off their hands and paid for. The labor here is all employed, with every prospect of remaining so for some time, while the farmers are enjoying equal prosperity. There are many building operations in this section, and we know there would be more were it not for the high prices of everything entering into the construction of buildings.

DELAWARE.

The demand for goods has been greater than in any previous year, particularly with the manufacturing trade in this city. Our stock is somewhat larger than usual, owing to increased trade, and purchases made at old prices. Collections are very satisfactory. The farmers are suffering from short crops, owing to the dry weather earlier in the season, the hay being especially light. Later crops, like peaches, corn and potatoes, will be large and with advanced prices they should have a fair year. Labor is well employed, and business in the city is good. There is more building than usual, and a number of large factories are in contemplation.

We find an increased demand for our wares of about 20 per cent. Crops are fair and prices are better. Catalogue houses are diverting trade somewhat, while stocks are held in fair quantities. Collections are fairly good. Conditions were never better here. Every one who wishes to work is busy, and farmers cannot secure enough farm hands. The farmers financial condition is the best in many years. There are 18 to 20 dwellings under construction, and as many more contemplated for the fall.

The demand has been greater than heretofore. Good crops have sold at good prices. The catalogue house is an undesirable competitor. As to collections they are better than any former years. Were never so prosperous as now, and there is not enough labor to meet the demand. The farmers financial condition is the best known in 40 years of business.

The demand has been great. The weather has not been hot enough in this section for Door and Window Screens. Stocks are fairly heavy, and collections very good. Conditions are prosperous and good; every one seems to be employed. The farmers financial condition is good. There is a great deal of estimating, but so far not much building, owing to heavy taxes in this city and county.

There has been a great difference in trade even in nearby localities. Within 16 miles of us—because of the berry crop being large and prices good—trade has boomed, while berries in our territory are insignificant. Wheat is short in product 25 per cent. Collections are poor. Stocks are heavier than usual. Our immediate locality usually makes a better showing the last quarter of the year, for then the harvest of peaches, all fruits, and especially tomatoes for canners, sweet potatoes and corn crop, if prices are good, brings us money. Farm help is scarce. The complaint is common. There is plenty of help, but there are idlers who will not work. There is more building in prospect than for several years; an indication of prosperity.

The demand has been better this year than for a number of years previously. We have had trouble in getting goods. Our stock is full. Collections are good. Prospects are good. Labor is all employed, and not enough to meet the demand. Farms were never better as regards finances. Building and enterprises fair. Wheat crop good. Corn crop prospect good. We look forward to increased business in the fall.

MARYLAND.

Our trade for the past six months up to July 1 has been fully up to its average standard. We are in an agricultural district with very little manufacturing done, and hence, depend most altogether upon the farmer for our business, and as the agricultural interest has been for the past two or three years fairly good, we have necessarily received the benefit from same. We carry a good stock of goods the year round, which we always find advisable. Our collections have been good. The outlook to the close of the year we think fully up to the average. Financial condition of the farmers is good. Amount of building being done here is only moderate. New enterprises very few.

Demand for first half of 1902 has been slightly better than for same period in 1901. More building in 1902 is the principal cause of increased demand over 1901. Demands from farmers is not quite equal to 1901. Collections are about 20 per cent short, on account shortage in fruit and vegetable products of 1901. The fruit, wheat and corn crops for 1902 point to an active fall trade. Labor is fully employed, and if our farmers realize fair prices for their products we will expect full settlement from this class of our trade. Building is far in excess of previous season.

General trade conditions for the past two or three years, however, have not been as encouraging as during the three or four years preceding 1900.

The demand with us for goods as compared with other years is much larger, because we have worked the trade more constantly and are jobbing goods over a much larger territory. One of the hindrances to trade is the difficulty we experience in getting our orders filled by factories, and the necessity of the merchant being compelled to carry very large stocks. Our stock is heavy. Collections fairly good. The people are fairly prosperous and all who wish employment can get it at moderate wages. The financial condition of the farmers of this and adjoining counties is much better than for some years back. Indeed, we think we can safely say it is good, but they have learned the lesson of economy. New enterprises are now looming up very rapidly.

General Hardware trade not as good as might be, but better sales in Agricultural Implements. Stocks are about fair. Collections fair. Prospects for fall trade good. Crops rather short, but considerable building going on. Farms are in a fair condition.

DISTRICT OF COLUMBIA.

We are very much gratified with the volume of trade for the six months just ended. Our business shows a very healthy increase, which is caused by the unusual business activity throughout this section. Building operations have been affected somewhat for a short time only by the strikes among the building trades, but this seems now to have been settled in an amicable manner. Stocks on hand are fair, and we have no complaint to make in regard to collections. In our city we have exceedingly bright prospects for the next 12 months. All labor seems to be profitably employed, and, in fact, in some lines it is exceedingly hard to get as much as is required.

Our general business is greater than ever before, the cash business showing an increase of 50 per cent. over any previous year. Sales to War and Navy departments are very much lessened, shipments to the Philippines, Cuba and Alaska having almost entirely ceased. Our stock is about as usual. Collections are very satisfactory. There are practically no unemployed mechanics in Washington at present. There is a large amount of new building going on, embracing office buildings, apartment and private houses, mostly of good quality. We look for a large fall business.

CENTRAL NORTHERN STATES.

The reports given below reflect a very satisfactory condition in this important group of States, which are conspicuous for their manufacturing industries as well as for their agricultural pursuits. In nearly every instance a larger business is reported during the first half of the present year than during the same period of 1901. *Labor is fully employed, both on the farm and in the factory, and at good wages. Factories have been operated to their fullest capacity. The people generally are prosperous, and with fine crops a large and profitable business is looked forward to during the fall months.*

OHIO.

Our sales have been a number of thousand dollars larger for the first half of 1902 than they were for the same period in 1901. There has been a very active demand for many goods, staples have been hard to get, and factories are slow in filling orders. This being the case, it has required a larger capital to do business, owing to the necessity for carrying a larger line of staples. Many lines of goods have not moved in comparison with the staples referred to. Prompt payers have been as prompt this year as ever before. For some reason slow payers have been slower than usual. We have had about the usual number of losses.

The trade indications for the remainder of the year are very bright. People are generally prosperous, farmers, mechanics and laborers all getting good prices. While farmers are getting good prices, the harvest weather has been very unfavorable, and many will sustain some loss in securing their crops. The high price of labor and the dissatisfaction of mechanics as well as the high price of material, will operate somewhat against building with the masses. Yet there is enough building in sight to insure a good business. There has never been a time in the history of the country when the opportunities for making money in the Hardware business were any better than they are at the present time. While this is the case, there has never been a time when the Hardware business needed closer attention than it does just at this present time.

Our business for the first half of this year excelled anything we ever did before, and have enjoyed benefits from advanced prices. We had confidence in the possibilities of business this year, and anticipating difficulties in getting goods bought our stocks earlier and heavier than any preceding years. Our belief in the present prosperity lies in the satisfied condition of our moneyed interests in this country, and so long as legislation does not cross the interests of capital business will be good. Our collections are very good, but bank accounts are kept small from the fact that stocks have to be kept well filled, owing to the active mid-summer demand.

We see no reason why business should not be as good the last half of the year as the first half, or even better, provided we can get the goods to sell. The fact of not being able to get material has discouraged a good many enterprises, particularly in construction work. Makers of Builders' Hardware never caught up with their orders at any time during last winter. We have never received 50 per cent of our orders placed in February, which makes it difficult to satisfy our trade. Factories that have contracts should honor them, and they should not seek business at a higher price when they already have more orders than they can fill. The time will come when they will need our business, then we will not forget those who forgot our contracts.

The demand for Builders' Hardware has been better than we have ever known, which was created by several new plants locating in our city. The demand for other kinds of Hardware has been good; the only drawback we had was occasioned by strikes. Our stock is of the same amount as we keep on hand at all times or nearly so. Collections extra good. Prospects for the remainder of 1902 are very good. Our people are prosperous, labor is in great demand, our farmers are in excellent financial condition, and there is a large amount of building in progress. We are satisfied with our present business and future prospects.

The first half of 1901 shows an increased demand for general supplies, with an unprecedented sale in some lines. Without doubt stocks are kept well assorted if we except those items which have been difficult to obtain. We have found it easier to get fair profits for goods than in former years; a pretty sure indication that the people are generally prosperous. The farmers are particularly fortunate in this locality, having had a succession of good crops for which they have received more than the usual prices. Common labor is very scarce and no able-bodied man need be out of employment if he chooses to work for good wages. Several new and some enlarged manufacturing industries promise employment to an increased number of people, which will necessitate more dwelling houses for our growing population.

Business has been good; never better. The prosperity enjoyed last year has been an advantage to this year's business. The demand for building material never surpassed. Our present stock is more complete than usual. Collections are satisfactory, but not extra good. People were never more prosperous. People are fully employed, and labor is scarce. The financial condition of the farmers was never better; products abound and prices are good. With favorable conditions we expect a fine business during the balance of the year.

The first half of 1902 has surpassed former years about 15 per cent. We have no special influences to affect business. The farmers have been prosperous and are in a good humor to buy. Stocks are heavy and collections very good. The indications for business during the remainder of the year are good. The people all seem to have more to do than they can procure laborers to perform. Farmers have had a good summer crop, and are in good financial condition. Building in this country is more than usual this season.

The demand is about the same as last year. Believe stocks are heavier than the average. Collections are unusually good. The people in general have money above the average. All have work who want it. Farmers have more money than for some years. New building aggregates about the same as last year.

INDIANA.

The demand for goods has been heavier than any previous year, about 30 per cent. in excess of 1901. Good prospects for the farmers; building and organization of new manufacturing plants in the cities we believe to be the reason for increase. High price of Window Glass, slowness of many manufacturers of Hardware and Tools, also scarcity of Bar Iron and Steel have hindered us very much. Estimate it cut down our sales 20 per cent.; had to cancel many orders and decline some. The trade in general is carrying well assorted stocks, not over large but full. Collections are better than in 1901. Money seems easier than it has been for ten years, farmers especially are able to pay cash for nearly all they buy. The people generally are prosperous, money seems to be in the hands of the mechanic, laborer and farmer and business man. Indications for latter half of year flattering.. Central and Eastern Indiana are doing much toward adding to Indiana's reputation for new manufacturing establishments.

Sales are ahead of last year. There is too much competition of the department store, cheap John, 5 and 10 cent stores. We are injured by wholesale Hardware concerns catering to the retail trade. Stocks are light but well assorted, and collections are fair. The manufacturers and wholesalers seem to get the bulk of the prosperity. Labor is fully employed, but at low wages. The farmer is financially in good condition. There is not much building; the most of it being wooden, of cheap class.

Demand in all lines except Farming Implements the heaviest we have ever had. Was a poor breaking Plow season with us, owing to very favorable conditions of the soil. Wet weather has damaged the hay and oats crop to some extent, but if fair weather should prevail from now on our harvest will be very gratifying, and as soon as it is assured we expect a heavy increase of fall business over other years, as our farmers are very prosperous at present and another good harvest will make them spend money freely. Collections will be good from the same causes. Our stocks are fully assorted in anticipation of large fall business. Labor very fully employed and hard to find sufficient men to work in the common avocations. Our farmers are doing a great amount of building and making improvements of every kind, especially in new barns, outhouses, wind pumps, fences and other permanent betterments.

Trade in January and February very light, owing to unfavorable weather, but has been much better since. Stocks have been full owing to exported trade, and collections are fairly good. Wheat crop above the average in quantity, quality good and prospects much better than for several years.

Our city has made many improvements, with a goodly number of residences built and being built. Our farmers have plenty of money and good crops of corn, oats and hay in sight, and an excellent crop of wheat now being hauled to the elevators. Farms are changing hands at good prices and new improvements are being made by the farmers which will stimulate trade materially. Indications for the future are good.

In Builders' Hardware, Heavy Hardware, &c., trade has been very good. In summer goods, such as Garden Hose, Lawn Sprinklers, Swings, Hammocks, in fact, all kinds of hot, dry weather goods, our trade has been materially held back by too much wet weather. Paints have also suffered from this cause. Our collections are good. Stocks are generally light. I think people look for lower prices, although the condition of the market on raw materials would not appear to justify this opinion at present. All our factories are running full capacity, and one of our leading manufacturers remarked last week that if 3000 men were available, all could get employment here inside of ten days. Crops are good, the largest in years, in wheat, oats and hay, and corn looks promising, also potatoes. Our farmers have a good local market and are as a class prosperous. Building is brisk. We look for a good business this fall.

My trade holds its own as compared to most recent years. Can remember doing much better in the 80s' before the advent of the 10-cent and department stores. Money seems plenty and people generally are flush. This makes trade more cash and less credit. Cold and rain in June cut down trade in the best month of the year. May was better. This is the time of year for low stocks; mine is light. Collections fair. Many people are apparently prosperous. The clerk or wage earner having to pay present high prices for his living is *not* so generally prosperous. Labor is well and generally employed. The farmers must be rolling in wealth. The high prices they get would indicate great prosperity. Besides there are good indications of a big crop in everything but fruit. Building here is going on lively.

Demand for Wire Fencing, Barb Wire, Plain Wire, Nails and Builders' Hardware has been better than other years. We have been delayed by not getting prompt shipments. Stocks are light. Collections have been good. People generally are prosperous. Labor is well employed. Farmers' financial condition is the best in years, with good crops and high prices for farm products. The outlook for new business is good.

Demand varies little with that of 1900 and 1901, except for Buggies, which is short. Mail order houses gathering quite a lot of local trade. Stocks are of average volume. Collections slow. Crops are exceptionally good this year in Southeastern Indiana. All labor employed. Farmers have been virtually bankrupt for a year, but with promising crops they will come to the surface again and will buy sparingly. Average amount of building and new enterprises in progress. We think conditions point toward prosperity.

The demand has been large and the supply, as concerns ourselves, has been in excess of former years. Our sales compared with other years are largely increased. This is probably because the people of this city and county are in more favorable circumstances than formerly, and they have a desire to be up with the times and buy freely. Stocks are reasonably heavy—seldom grow less—but gradually added to. Collections are favorable. Farmers are getting in good shape, have fine crops and are getting top prices for all farm products, better than for many years. As stated above, nearly all classes are, and have been, prosperous, which must indicate good for the future. There is plenty of work, both on farm and in the trades, and all workmen may find profitable employment when they really want work. Labor unions are very strong in this vicinity and work is to quite an extent, in some lines, retarded. Much building is being done in this city and county.

MICHIGAN.

Sales 20 per cent. more than last year, which were 20 per cent. more than year before. General prosperity the cause. Our special hindrance has been lack of efficient salesmen, men who will "cultivate" customers and take a live, conscientious interest in their work. Our stock is heavier than ever before. Larger demand has necessitated larger quantities of everything and we are not counting on a declining market just yet. Collections generally good.

Business for balance of year ought to be good. Continued heavy rains with loss of crops will have a bad effect, of course, and the strike fever is another factor—one of the symptoms of that proverb which says "The American people cannot stand prosperity for more than two or three years." High prices of labor and material are being felt to some extent in the building trades. Manufacturers doing a good business, so prices are maintained.

Jobbers busy, and therefore not chasing the consumer so hard. Consumers have money and most of them like to spend it. We hope these conditions will prevail another year or two, but who can tell when the slump will come?

Business has increased from 20 to 25 per cent. Better crops and higher prices for crops and live stock. Catalogue houses or department stores have been troublesome. Stocks larger than in former years, but small for the volume of business. Collections have been fully up to if not ahead of last year. In some cases obligations have been discharged before due, showing a tendency to retire debts and not hold the money for current needs as in former years. Prosperity of the people is quite general. Labor is fully employed; any one who will work is in demand; in fact the demand has exceeded supply. Financial condition of the farmer is good, and indications point to an increasing volume of business during remainder of year. At least 25 per cent. increase in new buildings; a good share of new barns made necessary by increased crops.

We believe this information will cover our county of Montcalm, for what we report appears to be general in our county of 20 townships. Corn and some other crops like beans are backward, owing to late planting and heavy rains, but we have had a pronounced gain during past ten days.

The demand for all kinds of merchandise exceeds previous years. Hardware has been in great demand from the fact that there has been much new building, and plenty of repair work going on from early spring to the present date. Prices have been steady in most lines of Hardware, which has had a tendency to give confidence to dealers and builders. Hardware stocks have been kept well assorted and are well filled to answer the extra requirements that are needed to supply the extra demand.

The outlook seems favorable for a continuance of a good business into the fall. The floods of continuous rain are a back set on gathering hay and grain, which may prove very damaging to crops, and if a change does not soon come will prove harmful to business. Thus far collections have been exceedingly good. Labor has never been more generally employed, with an increase of wages of at least 25 per cent., which has greatly encouraged and stimulated business, affording the laboring man more money to supply his neeeds. We are hopeful that the last half of 1902 will prove as good as the first six months have been, a great success.

Owing to cold and rainy weather outdoor work for carpenters, painters, &c., has suffered. Farmers on low land complain very much. In June we only had 27 days of rain; really the whole month was cold. Corn is poor, sugar beets suffered, other crops, except potatoes, are fair, and on high land better than last year; but it keeps on raining, and some hay, wheat and oats are spoiled by the rain. Everything is three or four weeks behind other seasons. Fruit is not as good as it might be; lots of berries.

Unless the farmers get in their crop without being spoiled by the wet weather and the coal miners' strike is settled our

fall trade will suffer. Provision, meat, &c., are high. Laborers are not satisfied with present price for labor, and I do not blame them for it. Many days of labor have been cut out, owing to the miserable weather.

Collections have been good, but for the last two or three weeks business has dropped off, and collections also. Country merchants buy light. Should rain stop we will have a fair crop and fair fall trade. I do not expect fall trade will be as good as trade the past spring.

Demand has been equal to last year, which was a good year. It would have been 25 per cent. better but for the unseasonable weather which we have had since early spring. Our stock is just as we would have it. Not too heavy, but evenly balanced. Collections have been fair. Labor, in most lines, cannot be secured at any price in this territory, hence the people are enjoying more than the ordinary prosperity. Builders who have held off for lower prices on materials realize that they are to be disappointed, and the building trade is enjoying a boom this year as a result. Crop reports the past few days are bad, as a result of the continued wet weather. Up to this time, however, everything has looked very promising.

The demand with us about 10 per cent. better than 1901. Hindrances are catalogue houses, dealers knifing each other, new dealers starting in who are inexperienced and little realize natural cost of doing business. Stocks here a little heavier to meet the larger demand. Collections a little better than normal. We think trade will equal the proportion of the first half. Labor is all employed at increased wages. Farmers are in better shape financially. Residence building quite brisk. No new industries here, but some are going up in our neighboring cities.

One great reason for our increased business is our fruit business, which is being rapidly developed. We are advertising our natural resources, and many newcomers are coming in who spend money.

We have done more business during the last six months than ever before. Farmers and laborers are both getting best prices for their product and labor they have in years, and are buying more freely. Our stock is heaviest we ever had, and collections are very good for this time of year.

There is every reason to expect a good business for remainder of year. In spite of a very wet season crops are going to be exceptionally good. Labor never has been so well employed. In fact, the demand far exceeds the supply here, and many people who want to build or repair simply cannot do so, because they cannot get help. Wages are from 25 to 50 per cent. higher than one year ago. Farm lands and village property have advanced from 25 to 50 per cent. Our banks have more money than they can loan, and there is by far the healthiest state of affairs that has existed around here for years.

The demand has been good up to this date. Stocks are about the same as other years. Collections are very bad. People seem not to have the money needed. Prospects not very good at present. Farmers' condition not good, on account of excessive rain.

The demand for goods as compared with other years is larger. Goods sell easier. Not much shopping around, as we aim to keep all the goods in our line that would be naturally called for, and sell as cheap as equal quality can be bought. The people are prosperous; every lady has money, because work is plenty and wages good. Farmers are in good financial condition, are getting good prices for their products and outlook for crops good. Considerable building going on.

Trade has been best in years. Farmers had good crops at good prices, which makes trade and payments good. Stocks in hands of dealers large, notwithstanding the high prices. Wheat is about harvested, and is good yield. Grass same. Oats promise well. Corn and potatoes are backward, but may come on. Live stock very high. Everything promises a good fall trade.

Demand is considerably lighter than for several years, influenced to a good extent by the drop in price of Copper and the after effects of the Copper boom. Collections are slow. Stocks are lighter than usual. Prospects in this neighborhood are not too promising. Number of men employed is much smaller than in past, but those employed are receiving good wages. Those employed are influenced in their purchases by the general feeling of uncertainty of what the future holds for us. If the larger mining companies would start work on their properties on some of the undeveloped lands it would give employment to a large number of men and make times better.

ILLINOIS.

Trade in general has not been as good as last year up to July 1. In 1900 we had a good corn crop, and that made business good for the first six months of 1901. The last six months of 1901 business fell off, owing to the dry weather and pretty near a complete failure of crops. A recent rain ruined about three-quarters of the crops in our bottom land, but was a great benefit to the balance of the county. Stocks are in fair shape. Collections slow yet, but think they will be better in 30 days. From the present outlook there will be a good fall trade, and taking it the county over the crops are the best we have had in ten years. Wheat was damaged some by wet weather, but none thrashed out less than 20 bushels, and from that to 40. Farmers are more or less in debt, while labor is pretty well employed.

The years 1900, 1901 and 1902 have all been good years. Last year the drought injured business during July and August. This year the weather has been cold and wet, and is still raining. High prices for farm products is stimulating business here; also locally the rebuilding of our city, which suffered severely in 1900, but is now better than ever. Stocks of goods here are larger than ever before, and collections are good. The people are more than usually prosperous and it is difficult to obtain laborers. Money is plentiful with the farmers and there is more building going on and new enterprises started than usual. If farm products continue to command good prices farmers will make extensive and general improvements.

Early business has been good. The continuous rains for the last month have interfered seriously with business. Stocks of goods are light. While the trust idea is not popular yet the fact that prices are maintained at an even level gives the dealer confidence that he would not have otherwise. The prospect for fall business is good. A large amount of building is being done. Labor is well employed at good wages. The high cost of provisions and prices generally being higher on every thing hinders free buying, making collections slow. Our farmers are in a good financial condition, but if the rains continue it will ruin this year's crops. No hay has been put up, oats are all down, and much of the corn is down also. Of course if we get a few days' sunshine things will look different.

Trade is good, possibly 10 per cent. better than last year on account of abundance of work for laborers and mechanics, good crops, with excellent prices for the farmer. Our stock is fairly heavy and collections are better than for ten years. There is plenty of money and considerable activity in building, notwithstanding high prices of material and labor. Farmers are very prosperous.

The demand for goods is light, owing to a failure of the corn crop of 1901. Trusts and department stores prove serious hindrances to trade. Stocks, as a rule, are very large; while collections have fallen off 25 per cent. While the wheat crop is good, it has been damaged some by rain. Labor is fully employed, and the financial condition of the farmers is good. There are only fair prospects for building and the inauguration of new enterprises.

The demand for goods has been considerable better than previous years. Farmers have been encouraged on account of good prospects for an enormous yield of grain through this section. Stocks are now light, but collections are improving. We depend wholly upon the farmer in this section, and as we have turned out a crop of wheat which will average 40 bushels to the acre it looks as though we would all prosper. Labor is well employed: the farmers could not get help enough to do their harvesting. There is a great deal of building and repairing now being done. Things look generally good.

Business this year has been better than ever before, about 15 per cent. more than last year, which was the best we ever had. We are not having any special business troubles. Stocks we believe are larger than ever. Collections are very good. There seems to be every indication of good business for the balance of the year. Labor is well employed and most of the factories and coal mines are very busy. The building business is very good and prices were probably never better. Some of the bottom lands have suffered great damage by high water, but aside from this our farmers are in fine condition financially.

The demand for Builders' Hardware and Heavy Hardware is better than last year. In this section of the country catalogue houses have affected business somewhat. The rains have affected the Paint trade, which was very good the first of the season. Stocks are a little heavier than last year. Collections are about same as last year. Prosperity of the people good. Labor is all employed here and at good wages.

Farmers have money enough to hold their grain. About 10 per cent. more building here than last year.

Business about the same as that of 1901. Excessive rain has damaged crops and may injure volume of business. Our stock is larger than usual. Collections are fairly good. People are prosperous. Labor well employed. More money in our banks than ever before. Wages high and this somewhat retards new building enterprises.

Trade good: better than former years. We carry good stock all the time. Collections good. Labor all employed at good wages. Building never better. Good crops in prospect, with assurance of good prices. Farmers are building big barns and repairing generally. Farm property advanced from 50 to 75 per cent. the last year, selling from $60 to $100 per acre.

WISCONSIN.

The demand as compared with former years has been especially large. The great expansion in business and manufactures of all kinds has had its effect on Hardware trade in general, and stimulated trade to a greater extent than ever before. Labor has been very scarce, both in manufacturing and farming districts, making it hard for goods to be turned out. Stocks in the hands of dealers have been light, collections, on the other hand, have been good.

The prosperity of the people is something remarkable and wages have been high. Prices of farming products have also been exceptionally high, leaving plenty of money in the hands of the farmers. As for building, manufacturers in general have increased the size of their plants to keep up with the demand for goods, working day and night in some cases and over time very often. There is no doubt that this prosperity will continue for the next six months, lots of the factories having orders on hand placed three and four months ahead. This promises to be the banner year of mercantiling and manufacturing.

Business in all lines has been good in the first half of 1902, as good as and perhaps better than, the first half of any year for 20 years past. No "boom," no "speculation," leading to a possible panic, but a steady run of business with farmers, builders and manufacturers. This is not owing to any special influence. Abundant crops with good prices for all kinds of farm produce have more to do with it than anything else. Money is abundant. Collections good, borrowers few, lenders many. We look forward for the same conditions to prevail for the next six months and longer.

Demand is fully equal to last years. Farmers never had more money. Stocks are fairly heavy. Collections, when pushed, are better than commonly. We find that the better grades of goods are the ones that sell, in fact nothing is too good. Labor is all employed, and you have to beg for a mechanic or laboring man. I see no reason why business should not round out the year in good shape.

Business very good considering local conditions. Trade is more spasmodic than we have ever seen in over 20 years' experience. One month sales ahead of any year, the next month away below corresponding month of previous years. Everything looks favorable for the future, but people are beginning to be more careful than they have been heretofore, having a feeling that good times can not last always. Trade in our city would be better than ever if it were not for the loss of a large factory employing 200 or 300 men.

Demand even better than in 1901, owing to good crops, easy money market, general prosperity. Stocks light compared to volume of trade. Collections good. Everybody is employed at good wages. Farmers, literally, have more money than hay. Building in city fair, in country great. Outlook for balance of year is that we will surpass any year in the last 20. We believe that good times will continue for some years.

Business this year is greater than last. The wet weather during May and June has retarded building operations, but not so much as the high price of lumber. Unseasonable weather has also affected sales of Refrigerators and Gasoline Stoves. The increased use of gas for fuel has seriously affected city Stove trade. Competition from catalogue houses is also felt in all lines. Stocks are well up to average. Collections are fair. Locally, high taxes are felt.

Business should be excellent this fall. Every one is at work with good wages. Mills are running full, with plenty of water. More than an abundant crop will be harvested with two weeks of favorable weather. Hay is saved, and is extremely good quality and extra quantity. Farmers are full of money. A great deal of rebuilding and repair work and a fair amount of new buildings.

Our sales for first half of this year have been the largest in the history of our business, the increase being mainly in our cash sales. There is more money in circulation among farmers and laborers than in many years past. Farm produce is bringing high prices and farmers are buying freely. Stocks are large and collections good. Our factories and mills are all running full time and mechanics and laborers have no trouble in finding employment at good wages. Farmers are more prosperous than I have ever seen them before, and are doing more building, buying more machinery, Buggies, Sewing Machines, Ranges, &c., than in other years. We look for a large business the balance of this year.

The first half of 1902 compares very favorably with other years. Strong competition curtailed trade the first four months, but later business became normal. Stocks are about an average. Collections fair. Farmers are in fair condition financially. Winter having been unusually short made quite a difference. Considerable building, both in city and country.

The demand for goods in all lines has been far greater here than in any previous year, and has consequently demanded larger purchases and a greater variety of goods, although with conservative buying it has not increased the stock, as sales have kept it down, besides selling goods that have lain on shelves a long time: trade is constantly changing with us. Being so near a large city we are virtually a part of it, and must contend with all the elements that go to make up a large center of trade. Collections have been good and customers pay up more promptly than heretofore, yet there are always people who cannot stand prosperity and are always behind.

As to the prosperity of the people in general, it is apparent that with increased wages in all lines and demand for help that cannot be filled, if they do not in these times lay something aside they never will. The great increase in saving deposits surely indicates this. Farmers in our immediate neighborhood are mostly all wealthy, as the second generation is enjoying what the pioneers laid the foundation for. Building is fairly good here, but the demand for houses is away beyond the ability to supply and 100 houses could be rented here if they were to be had. Our factories are busy day and night, and are constantly calling for more help. New enterprises are on the *tapis* and we expect to secure our share. The prospect for fall trade is good, and I expect demand in all lines will be larger.

The footing of our sales for first half of 1902 shows an increase over 1901. The heavy fall of rain has delayed a great deal of work, and farmers are feeling downhearted. Stocks, as far as my observation goes, are lighter. Collections are fair. People are generally prosperous, and there seems to be plenty of work. We believe that the financial conditions of the farmers are improving. Building is not quite as extensive as in 1901, but still it is in a healthy condition.

Trade has been good, stimulated by favorable condition of crops. Stocks are medium. Collections are good. People are prosperous. Not an idle man. In fact, scarcity of help is proving a detriment. Farmers are all getting a little ahead—our bank deposits show that.

Demand larger than other years. Good prices for farm products. Stocks now fairly good. Collections good. All classes prosperous. All employed. Labor scarce. Building mostly repairs and betterments, both locally and among farmers. Not so much of new buildings, on account of high prices for materials. Merchants generally are having larger business than usual. Crops now being harvested promise exceedingly good. The farmer is doubtful about prices, but is feeling good.

The wondrous development of this section of the country has opened up considerable demand for goods in our line, and as compared with other years is larger. The steady prices which have prevailed in Nails and Wire have been very beneficial to the retailer and take off some of the curse of the Billion Trust. On the whole, stocks are heavier than usual, because the dealer has not the fear of declines he had years ago. All the indications point to a prosperous year, and the high prices prevailing for farm products certainly betoken prosperity for some time to come.

SOUTH ATLANTIC STATES.

In this group of States the situation is on the whole quite satisfactory. A generally good demand for Hardware is reported. Much building is going on, but the activity in this department in some sections has been adversely affected by the high prices of materials and labor. Manufacturers have been running to their full capacity, and a steady expansion of enterprise in this direction is reported. Labor is fully employed, and the promise for the business of the fall months is excellent.

VIRGINIA.

Speaking of demand for Builders' Hardware this season, we beg to state that while it has been very good we have not had as much call for high grade Hardware as last year. We attribute this fact largely to the influence which has been exerted over the building business in our city by the increased cost of construction. There have been many plans gotten out for large building enterprises, which have been withdrawn from the market indefinitely, awaiting lower prices. Therefore our business has consisted more of smaller bills, such as are adapted to the cheaper class of buildings. Then, again, our city has experienced this summer much trouble with mechanics, many of whom have been out on strikes during the past two months. The stock of goods that are being carried here we believe are heavier than ever before, such certainly being the case with ourselves. Collections we have found to be up to the average.

We have not known in many years so much general prosperity shown through a widespread activity in all the various lines of business. There has been no lack of employment for every man who was capable and willing to work. We know of no idle people with the exception of the striking mechanics. The farmers in our vicinity are a very thrifty class. They have had a fairly good season and are getting good returns. There are many new building enterprises now on foot, considerable valuable property having recently changed hands, most of which is to be improved by the erection of substantial buildings in the near future. So that all persons interested in the building trades are looking for good business during the coming autumn.

The demand for goods, particularly heavy goods, has been far beyond the supply, and greater than we have ever known on Fence Wire, &c. The delay in getting goods has put us to the most serious inconvenience and loss of trade. Could have done at least 25 per cent. more business had we been able to supply the demand. Collections have been good.

We look for good fall business, but doubt if equal to the past 12 months. The wheat crop in Virginia is not over one-third crop. Hay about same. Very little fruit. The apple crop of this State is now a very considerable item. Good prospect for corn, but unless we have rain in the next few days it will be very short, as now is the time rain is most needed. We expect collections to be poor this fall for reasons named. We do not think it possible that business throughout this section this fall and next spring will be as good as heretofore. The farmers have made money, but the most of it is invested, and unless the corn crop gives them "spending money," we expect limited demand.

The Hardware business in this section has been very good and, in fact, a little better than last year, due to several causes, such as building and other improvements going on, and to the numerous and varied articles which the Hardwareman can now carry, and by which by keeping abreast with the times can find profitable business at all seasons. Our collections are very good. The general condition of our section is very good financially, though on account of bad crops of hay and wheat our customers will have to confine themselves to actual necessities.

Demand might be said to be better, due to activity in lumber and good crops. Stocks, we think, are quite full. Collections are about as usual. Our people are enjoying general prosperity. Labor is fully employed—indeed, it is scarce. Unusual amount of building is being done. Wheat crop was small this year, and crops at present are needing rain badly.

WEST VIRGINIA.

Trade for the first half of this year has been satisfactory. Comparing the demand with other years, we find the volume not so large, but the advance in prices of so many goods make a good showing on our books. However, when the decline in prices sets in, as it surely will sooner or late because prices are unnaturally high, and when we have some day to find the goods carried in stock worth from 10 to 20 per cent. less than we have invoiced them this June 1—as, for example, Galvanized Sheets and Enameled Ware have done in the last few weeks—our last part of 1902 might not look so rosy. High prices hinder trade to some extent, particularly in building. The impression seems to be that building material is too high, and goods of this character while moving fairly well are always bought with hesitation and mistrust for the future. Our stock is as full as we ever had it and collections are only a good average.

We believe we shall have a good trade for the remainder of this year. The people in this section of country are reasonably prosperous, for the reason many farmers have sold the coal underlying their land, and others are getting oil rentals for leases on their farms. But where these conditions do not exist our farmers are not contented and the young men are leaving the farms for anything offered them in the way of employment. Our oil fields are not what they once were, and this class of labor is not employed fully. We are hopeful of the future and trust we will not be disappointed in our last half of 1902 when we take stock January 1, 1903.

Demand has been about the same as last year. We have a good deal of difficulty in getting goods. Stocks are light. Collections fair. People are prosperous. Farmers are in fair financial condition; a good many in debt. Good many new dwellings in course of construction.

The demand has been in excess of other years. Stocks unusually full. Collections good. Everybody who makes an effort seems to be prosperous. The demand for labor is in excess of the supply, no man idle except from choice. The farmers were never in a better condition. Building is much in excess of any year since 1892, and more new enterprises started than for many years.

The coal strike has greatly paralyzed business at this place, being in close touch with the New River coal fields, where all work is suspended. The outlook for the second half of the year is hardly as favorable as we could hope for; some new building in progress, but the profits in that line are very small as prices are being cut down to 5 to 10 per cent. basis.

NORTH CAROLINA.

Failure of crops in this middle territory last year has made the demand for goods less than for 12 years. Merchants have a well selected stock. Collections under the existing conditions are not what they should be, but very few merchants have failed. The elements have blessed the people of this section and the general crop reports are above the average. Cotton, corn and tobacco is in fine condition and we hope to have more business than for the last 12 years. Farmers will be able to pay out and start fresh for 1903. Good prospects for building and new enterprises in fall of 1902-3. All classes of labor, white and black, work in harmony in harvesting and factory work. The South is in a position to equal the East, West or North in her rapid growth in new cotton mills and other enterprises, and with an increase of good citizens with some capital offers inducements that are very inviting.

We find the demand for goods in all lines good, with larger sales than for any year we have been in business, which we ascribe in a general way to the rapid upbuilding of western North Carolina. Farmers using more improved machinery. Stocks are of an average volume. Collections fair. Our greatest difficulty is lack of any co-operation in holding up prices. Business promises well. Railroad extensions and development of power should, with building, give good employment to mechanics. Corn is doing well; wheat failed. Farmers, however, seem in good shape.

The demand for goods generally has been good. The Implement trade very dull. The wheat crop a failure. (This is not a wheat section.) Good prospect for corn if weather conditions are favorable through balance of July and August. Tobacco prospects good, subject to conditions above stated. Not much cotton is raised here, but conditions good for what we have. The prices of tobacco are better than last year. Collections are only fair. Conditions have been unfavorable for two years and money is scarce with farmers. We think the people are prospering, making crops at less cost—*i.e.*, raising more supplies at home. Labor is in demand. Our factories are all running full time and wages are as good as they have been. The farmers do not own as much as they did ten years ago, notwithstanding bad crops for two years.

SOUTH CAROLINA.

The demand for material for structural work has been much better than for corresponding part of 1901, while the Hardware trade in agricultural lines has fallen off materially. The activity in Textile Mill department, not only the enlarging of present plants but the erection of new mills, together with an increase in the number of dwelling houses in town and city as a result of new mill enterprises, have produced a demand in the Hardware trade in these special lines which is very gratifying. On the other hand, the light corn and cotton crop of the country of last year, with the low price of cotton realized by the majority of farmers, has

had a tendency to check the demand for Agricultural Hardware to a material extent, as there has been a tendency to endeavor to make the crop of 1902 on as close margin as possible, hence, there has been a perceptible falling off of this class of trade. Stocks are as complete as usually found at this season of the year. Collections in the main have been good.

The present prospects for crops are good and should favorable conditions prevail and good prices be realized for the present growing crop, the farming class will be able to recover from the effects of the short crop of 1901. The labor of the country is fully utilized, at good prices, by the demands of the farm, together with that of the various enterprises and improvements in progress in town and city.

The general demand for Hardware and Agricultural Machinery for the past six months has not been so good as usual, owing to the short cotton and corn crop, and almost an entire failure of oats and wheat. Owing to the light trade most of our small dealers have carried over a considerable part of their stock. Those that could not carry had to unload at cost, hence a lot of unremunerative business. Stocks are fuller than usual at this season. Collections have been somewhat slow.

Our people are in good shape, however, for the coming year. Cotton and corn prospects are generally very fair, and if prices average up we look for a first rate trade. This country is getting literally full of cotton mills, giving employment to all the white labor that there is here, hence, in case of a crop failure, the mills carry the laborers over through the winter months. Many new cotton mills are now being built all over the upper part of this State, and a great portion of the old ones are enlarging. On the whole the outlook is encouraging.

Business has been better than ever before. Stocks are rather light. Collections have been very good. Prospects for the remainder of the year are good. Crops are fine. Work plentiful. Farmers are in fair shape only. Quite a number of buildings going up, and a great many more spoken of.

The demand seems to be as good and possibly better than in former years. In this section, however, agricultural pursuits last year were a failure and this has, of course, had its effect upon the cash business for this spring and summer, and no doubt has weakened the demand to a certain extent. Stocks are fairly well filled for this season of the year. Collections have been very good, and we are anticipating better things now soon. The people are generally in good spirits, and up until July 1 crops of all kinds were healthier and showed up better than ever before known in this country, but the extreme dry July has injured corn and tobacco considerably. Cotton, however, which is a dry weather plant, did not suffer and is doing nicely. The farmer, financially, is not up to his average, since last year was such a record breaker. Some new buildings are being erected, and the general outlook for a good fall trade is very encouraging.

Business quite steady. Have had a good average year. Stocks are fairly good. Collections slow. People are fairly prosperous. Labor is pretty well employed. Financial condition of the farmers is generally good. Quite a lot of building in our town.

GEORGIA.

Our sales were less for the first four months than same period last year, but fully as much as for several years prior to 1901. May and June sales were better than last year. July is falling badly behind, probably on account of prevailing intensely hot and dry weather. Stocks seem to be fuller than usual at this season, not on account of poor sales, but because fall stocks are being bought earlier. Collections are about up to the average.

Merchants and farmers alike seem to be in a fairly prosperous condition, and labor is in demand. While the outlook for fall business is not very promising just now, a good season of rain and cooler weather would make a great difference.

The worst hindrance to the Hardware dealer in this town is the small stores. These carry a little of everything, especially dry goods and groceries, and Hardware as a trade drawer. Jobbers sell this class of trade as cheaply as to the exclusive Hardware dealer. We think this will eventually force every merchant in a small town to carry a mixed line of goods. Our stock is heavier than ever before, but on account of last year's poor crop the demand is not as great as it should be. For the same reason collections are greatly behind. Indications now point to better times. The prospect for cotton, which is the main crop in this section, is the best we have had in years, and the farmers, as a rule, have not involved themselves to any great extent. This being the case, and with a stiff price for cotton, the country will experience remarkably good times.

As suggested above, we think the exclusive retail Hardware dealer should be protected against the general merchandise stores. There is but one way to do this, and that is for the jobber to have two prices, and make the latter pay a higher price for staple goods, which is all he carries.

FLORIDA.

First half year has been remarkably good, the increase over corresponding period has been about 30 per cent. The high prices realized for cotton has put considerable money into circulation, and we have also just concluded the most satisfactory truck season in years, as more than 35,000 additional packages of cantaloupes have been shipped from this station over last season. Our stock is very much heavier than at any time since we started in business, while collections are very satisfactory.

We confidently anticipate good trade for the fall season, every indication being that we will have large cotton crop, and, as there are no stocks of this (Sea Island cotton) carried over, we can see no reason why a good price should not be secured. Our industries are in urgent need of all the labor that can be induced to leave their fields for public work.

Business has been about 10 per cent. more than in 1901, caused by increase in production of farm and vegetable products. Stocks are medium and collections fair. General condition shows a small gain in general prosperity. Bank deposits are larger, and labor is well employed. There is a demand for small houses. School house, costing $10,000, has been erected this summer.

The demand for goods compares favorably with former years. Dry weather since June 15 has affected business unfavorably. Stocks of goods are about the same as in other years at this time. Collections were good up to July 1, but have fallen off since that time. Dry weather has cut crops short, and will affect business later. Labor is fairly well employed, and the financial condition up to the present time is satisfactory. About the usual amount of building has been going on. The oat crop was good, but the corn crop is short, owing to dry weather. Heavy hailstorms have injured the cotton crop. Dairy farms are in a prosperous condition, with a heavy demand for their products.

GULF AND MISSISSIPPI VALLEY STATES.

The reports in regard to conditions in these States are not so favorable as in other sections of the country, Louisiana being the only State in which a larger business than that of last year is uniformly chronicled by our correspondents. In the other States, owing in most cases to the poor condition of and outlook for the crops, due to insufficient rain, business has not come up to expectations except in a few instances. Labor, however, is fully employed and, with an improvement in crop conditions, a fair business during the remainder of the year will probably be done.

ALABAMA.

Failure in the corn crop in this vicinity last year imposed great hardship upon both farmers and merchants, and the amount of money going out for feed stuffs has markedly reflected upon all lines of general business. This being purely a farming section, our collections are made in the fall, hence it is too early to speak of that feature of the situation. Demand for goods is very slack. Farmers are not in good financial condition and merchants have been taxed to maintain them. The cotton crop promises fairly well, but corn is almost a failure again this year. At best we can only have a moderately active winter trade. There are few, if any, public improvements in progress.

The demand for goods up to 30 days ago was in excess of previous years, but on account of the long drought and labor troubles business was considerably affected. However, the mining scale has been satisfactorily adjusted and all mines are working on full time. The mining companies are buying largely, replenishing their diminished stocks. The drought has been broken and general rains are reported, making the agricultural section more hopeful; and, although the crops both of cotton and corn will be considerably short, there is a better feeling and we expect a good business. We have found the country merchant very careful in buying this year, not overloading himself. Collections have been unusually good, very few customers requesting to be carried until fall. Indications for a heavy fall business are very good, particularly in the mining district. Our city is very prosperous and it is almost impossible to get building material fast enough to supply the trade.

The demand in all lines is about 25 per cent. less than normal. Dry weather and high prices for corn and meat a principal cause. Stocks as a rule are full and collections

only fair. The farmers are in very bad shape and there is little building going on. We find our trade better on account of the "panic," as the merchants are buying from local houses in small quantities.

The demand for goods has been unusually heavy. At this time we are suffering from dry weather; corn and corn stocks have been badly damaged. Stocks are heavy. Collections are as good as usual. We look for a continuation of good times. Labor is fully employed here. The farms are in good condition and a large amount of building is being done.

There has been less demand for goods during this summer than last year. The drought has affected business and hindered trade somewhat. Stocks seem to be a little lower than usual at this time. Collections also are a little backward, farmers not paying until they find out how crops will turn out. The owners of farms are fairly prosperous, but the colored population and some whites who till the soil on shares are very poor, as a rule, and one reason is they have goods furnished them on mortgage, which cost them nearly two prices, which has a tendency to keep them poor. We are building a $50,000 public school and there are some blocks of buildings going up, as well as a few good residences.

Our business about 10 per cent. better than last year. The demand for Mowing Machines better than previous years. Stocks about usual. Collections fairly good. The people in our community are in a prosperous condition; a great many farmers have deposits in bank. A good many new enterprises are starting in our community.

KENTUCKY.

Good demand for everything in our line. Business 25 per cent. greater than last year. Some complaints about the high range of prices on iron and steel products; however, as the consumers continue to buy we judge the public have the money. Crops of tobacco were very good last year and brought good prices. Corn crop was fair to good and brought fancy prices. Cattle, mules, horses, hogs and sheep, too, have sold for high prices. At present we need rain very badly. Not had over half normal amount of rainfall during first six months. Has rained all around us, but very little rain here. Tobacco crop growing not over three-fifths of an average, and that late. Wheat yielded about two-thirds crop and brought 70 cents here, a very satisfactory price. Corn suffering more for want of rain; a big crop out and if we get rain soon will be as large a crop of corn as raised here for some time, but must have rain very quickly or lots of corn will fail to make ear at all. Hay crop only half and not good quality. Prospects on the whole not so good for future trade as past season. Buyers are beginning to do without some stuff, owing to dry weather and lack of confidence on that account.

The first half of this year has not been entirely satisfactory in all of our territory. A portion of our trade is in the extreme South, which depends upon the cotton crop, and as the cotton crop was a failure last year this part of the trade was affected by it. Stocks are very light in some sections, but, on the whole, are in very good shape. Collections have been very good. Indications for business this fall are excellent in all sections surrounding us. We have had one of the finest tobacco crops that was ever raised in this section, and prospects for another good crop are excellent. Corn and cotton are looking splendidly at this time, but are needing rain. Financial conditions of the farmer are very good. Improvements are about the same as usual at this time of the year. At the present time we are building a railroad from this point to Cairo, which is putting a great deal of money into this section, and we are feeling the influence of same.

Trade has been good this season on Wagons, Buggies and Harness. Hardware has been rather slow, though getting better with us every day. At the present time rain is badly needed. If weather continues dry for 10 or 15 days more will feel it strong. We have good stock of Hardware, Buggies and Wagons on hand. If we have good general rain trade will continue good. The farmers seem to have ready money to buy. Collections are good.

The demand has been equal to last year, if not greater, on most lines of goods. Difficulty in getting prompt shipment has tended greatly to hinder trade. Collections are good. There is a general prosperity in this section. The prospect is good for the farmer, conditions for good crops are favorable, and there is plenty of work for the laborer. Building is light.

Trade has been good for the first six months of this year. A little better than last year. Stocks of goods through this section of Kentucky in the hands of retail merchants are light, and collections are not as good as they should be. Trade, we think, will be good for the remainder of the year. The crops are now looking good, and a good crop in this section of our State will mean good trade for fall and winter. The farmers are in good shape and are feeling rather good.

Trade about the same as last year. Have been affected by a local drought here this year. I think if we have rain soon the prospect is fair for a good trade this fall.

MISSISSIPPI.

Trade in Agricultural Implements has been about the same as former years. Staple goods have been in large demand, but owing to the failure of corn crops in this section two consecutive years the farmers have had little means for the more profitable lines. As a consequence the stocks on these lines are heavier than usual at this season of the year. Collections are a little slower than usual. Prospects for cotton are good; corn is a failure. No idle laborers, where they want work. Farmers are, as a rule, more in debt than usual, owing to being obliged to purchase high priced corn. Less building than in former years. With the continued good price for cotton we think this section will show an improvement the last of the year over the first half.

The first half of this year has seemed rather dull to us. We find that there is not a great deal of cash in the country. Therefore people cannot trade as they used to. Crops have been short for the past two years, and the farmers have run short. Stocks are light and collections slow. We are looking forward to next half of this year with brighter hopes, as the people are all feeling better on account of the fine prospects of the farmers. Labor is in demand at fairly good wages. Some new enterprises are opening up in this territory, but not many new buildings.

Owing to the scarcity of rain trade has not been good. Stocks are heavy. Collections are fairly good. Prospect for the future depends upon immediate rain. Ten days longer without rain will materially damage corn. Our farmers are in first rate condition; not badly in debt.

It has been very dull, and on account of the failure of the wheat crop and poor prospects of corn the outlook is not encouraging. Stocks are rather heavy. Collections are fairly good under above conditions. Labor is well employed. Financial condition of the farmer is very good. Very little building going on.

LOUISIANA.

Demand has been very good, and advanced prices make volume of business greater than last year. The uncertainty about Cuba has cut the sugar trade to almost nothing, but good price for cotton offsets this to some extent. Collections have been very good, and we have had very few failures. We look for a good fall trade, as the crop is very good and the farmers should have money. Quite a demand for building material. The sugar people are the only ones who are not in good shape, and when the Cuban question is settled this will be adjusted.

Our trade better than last year. Stocks up to average. Collections not so good as last year. Crop prospects in our territory up to average. Labor all employed. Farmers not in so good shape as last year, owing to last year's short corn crop. They are having to buy corn and meat at big prices, so are not looking for any big things for the remainder of year.

The demand for Hardware far exceeds that of any year in our history, trade in Builders' Hardware being exceptionally brisk. Our main resources—lumber and rice—are both in their banner year, the heavy rice crop of last fall making money plentiful the fore part of the year, and the demand for lumber is at present beyond the supply. Stocks in all lines are fairly heavy. No complaint as to collections. Our stock is much larger than we have ever carried before, caused by the general prosperity of the country combined with the "good times" of our own part and a consequent demand upon us from our customers for more goods and a better grade of goods. We consider the outlook for fall trade very promising, although during May and June we suffered an unusual drought, but showers during this month have repaired to a great extent the damage to rice. The building industry has been phenomenal, and from the number of buildings still to be erected it seems there will be no abatement in this line. Labor is well employed; here as elsewhere there is a scarcity, all wages at the highest notch. Everything and everybody seems prosperous, so we are sure that the remainder of the year will fully meet our expectations in all lines of business.

SOUTHWESTERN STATES.

In this great and important section, which includes Arkansas, Missouri, Texas, Kansas, Colorado, New Mexico, Indian Territory and Oklahoma, the reports indicate a fine condition of business, based on good crops, with, however, less satisfactory conditions owing especially to damage by drought in some parts. The people generally are prosperous and many improvements, public and private, are in progress or projected. Labor is fully employed and the indications are on the whole for a good business during the fall.

ARKANSAS.

Trade has been fairly good; much better than might have been expected in view of crop failure (on account of drought). The Government, in building locks and dams, and the railroad company building an extension up the river, have helped us all very materially to tide over the effect of crop failure. High prices interfere with trade—a carload of Barbed Wire and Nails now costs $1000—formerly $500; other goods in nearly same proportion, while our customers have not forgotten former low prices. Indications for fall trade are good. Crops look well. Labor is fully employed. Farmers are in fairly good financial condition and will this fall be able to buy a good many things that they had to omit last year.

The demand for Agricultural Implements has not been so good as last year, on account of last year's drought. Stocks are light. Collections good. There are fine crops of everything; hay, oats, wheat, corn and cotton. Financial condition of farmers fairly good.

Trade has been better than for some years past. I attribute this mainly to the fact that there has been quite a heavy influx of immigration from northern States. Stocks carried by our merchants are somewhat heavier than heretofore and collections are about as usual; possibly slightly easier. Crops are above the average so far. Of course late corn is as yet uncertain, but the early planting is matured. Yield of oats good; hay crop heavy. Hay is the principal crop here. Labor is all employed. Farmers seem to be in good shape and a large amount of building has and is being done.

Business for first half year has been about an average, owing to partial failure in last year's crop. Stocks about average. Collections are good. Our city and country are in a very prosperous condition. Laborers are well employed at good salaries. Financial condition of the farmer at the present time is very good. But upon this I base the crop prospect, which was extra good to a week ago. Since that time they have suffered somewhat for rain. Lots of improvements going on in our city, and the country is improving by adding improved implements, such as Cultivators, Reapers, Mowers, Binders, &c.

MISSOURI.

Demand is not as heavy by a third as much as in former years, wholly due to drouth of 1901, which affected farmers. Strikes and lockouts have reduced the purchasing capacity of mechanics. Stocks in good shape, while collections are slow. The farming community have bumper crops. Mechanics are getting higher wages and are fairly well employed. Farmers are in fine financial condition, as the price of live stock is unprecedented. The building outlook is good, but would have been 50 per cent. larger if labor troubles had not interfered. Public improvements are more numerous than for years. Farmers are contemplating putting up fine residences.

Trade has been light on account of the drought last year. A good wheat crop and a splendid fruit crop have helped out some. Stocks of goods are generally light, with collections good. Indications for business are fine. All crops are good and this will be a banner year for Southwest Missouri. The Financial condition of the farmers is A1, and new enterprises are contemplated. Crops are assured, if there are no more rains this fall.

The general trade has been better than during former years, but catalogue houses are a great hindrance to trade. Stocks are usually a little low at this time of the season. Collections are a little slow, owing to the extreme drought of last year. The prospects for a good crop were never better, which will make trade good. Laborers are all employed at present. Farmers are only in fair condition, owing to short crops last season. We find catalogue houses are the greatest hindrance to trade. Our cash buyers get a great many goods from them.

The demand for goods is lighter than usual, owing to the drought of last season. This we find the principal drawback to an active business. Stocks are fully up to the average, while collections are from fair to good. The prosperity of the people is improving, owing to good crop prospects. Labor is fully employed among the farmers. They have been obliged to borrow heavily to tide over the results of the drought last year. Consequently building is limited, and is below the normal.

Sales have been somewhat less than during the last half of 1901, as the result of the drought last season. Farmers had no corn or other crops to sell. Stocks, while not heavy, are well assorted. As we do a cash business we are not troubled with collections. The community is generally prosperous, and labor is well employed. While rain was too plentiful during the wheat harvest, prospects for corn and other farm products are good, so we anticipate a good fall trade. There is less building than there would have been because of strikes.

Notwithstanding the drought of 1901 the demand for General Hardware, Farm Machinery, &c., has been fully up to former years, in fact in some respects better. In our town and county Builders' Hardware has been rather quiet. This condition is due largely to the high prices of lumber and drought of last summer. Collections fairly good.

Indications for business during the remainder of the year were never better. People are generally prosprous, real estate and farm lands selling at good prices, labor fully employed; in fact farmers complain of not being able to secure all the help needed to save crops. Financial condition of farmers was never better. Our wheat crop is the largest known for years. Oat crop is good, and the best prospect for corn known to the writer in years. Hay crop is very good, and pretty much all harvested. We look for considerable building in the next month or so, after farmers are through with their rush.

The business for the last six months has been fairly good, increased in volume, but less profit. The causes of same are local, not general. Some drawback in the building line is caused by strikes and general dissatisfaction in the labor world. Stocks are broken in some lines. Good Builders' Hardware is hard to get. Collections are fairly good. Considering the condition of the crops for several years, all farm products command a good price. As a rule, the finances of farmers are all right. Everybody can work and earn good wages, no occasion for idle men. The farming community are very much encouraged, a rich harvest, especially corn is in sight. Some local losses by overflow of the Mississippi River.

TEXAS.

The Hardware trade in Central Texas has not been satisfactory during the first half of 1902. Collections were slow and poor, and sales light. The cause of this was an all around crop failure during the year 1901. The farmers, who should have had feed and forage to sell, had to buy same out of the proceeds of their small cotton crop, and pay unusually high prices for same, consequently they had little or no money at their disposal to buy Hardware or other merchandise, and many traders had to close up their accounts by note, payable the coming fall, and many lines of seasonable goods had to be carried over.

The indications for the second half of the year are more favorable, although corn, wheat, oats and fruit crops may be considered failures. The hay crop is somewhat better than last year, and the prospects for the cotton crop are decidedly better than they have been for several years. I am quite sure that considerable feedstuff has to be shipped in from other States, yet the prices will be materially lower than last year. Labor is fairly well employed. The banks have ample funds for business requirements, and the new buildings and other enterprises in process of construction are greater than the present business situation would warrant. Farmers, as a class, are not in as good financial condition as they should be, on account of last year's crop failure.

Trade this year will be later than usual, say 30 days. In volume it will about reach last year's, and will be less than the trade of 1900. Stocks are heavier than usual. Collections slow. Cotton prospect good. Corn has been almost a failure. Grain about half a crop. Hay and coarse feed about two-thirds of a crop. Competition close, prices being cut to some extent. Labor is well employed. Building will continue in good shape till January 1, 1903. Farmers are owing more than usual, and the same is true of the retail merchant. We look for more failures this year than any time during the last three years.

It is too early by 30 days to determine with any degree of accuracy the volume of fall business, but present conditions indicate a fair trade and fair collections.

Trade has been very dull, in fact the dullest in years, caused mostly by the early part of the year being dry. Corn in this locality is a total failure. Stocks are generally heavy. Cotton looks good since the recent rains and the people feel

more hopeful. Farmers are in very good shape, and it now looks as though trade would be good when cotton begins to move.

On account of the dry weather that has continued here during the year the outlook is very poor. Trade is lighter than it has been in the last three years. The demand for goods is very small. People are only buying the things that they must have. The crops are poor. The corn is almost an absolute failure in this section. The cotton may yet make some, but the outlook is far from promising. Indications are that the trade for the next few months will be very light. The financial condition of the farmers is not good as a rule. A great many obligations are outstanding that will be due this fall. They will have to be paid from the cotton crop, if at all. Very little in the way of improvement is under way.

Our trade has been quite satisfactory so far this year, comparing favorably with last year, which was the banner season for this part of the country. The failure of all grain and forage crops in 1901, however, has operated unfavorably and caused the people to go heavily in debt for feed stuffs of all kinds. Stocks are rather heavy. No collections at this season. We are said to have the best prospect for crops in the State. There are no idle hands here. Comparatively little building going on. If no disaster overtakes our cotton crop we are in good shape.

My sales during first half of 1902 were 36 per cent. less than during same period in 1901, caused by inability on part of consumers and country merchants to buy and my unwillingness to largely increase bills and accounts receivable. The special influence affecting business is short crops in 1901 and unfavorable prospects caused by drouth for the yield of agriculture during 1902, our corn crop being practically a failure, and outlook for cotton crop being considerably below the average. My stock is 6 per cent. larger than at same time in 1901. My collections for first half of 1902 are 26 per cent. less than during first half of 1901. Indications for business during the remainder of the year are that it will be below the average, for the reasons above set forth, the resources of this section of the State being principally agricultural.

KANSAS.

Our trade for the first half of 1902 has been as good as former years, except for the last few weeks, when farmers have been too busy at home looking after their crops, which are the heaviest we have had for years. Our people are all feeling Good with a great, big G. Everybody who wants work can get it out here at good prices. All labor is fully employed. Our farmers are all in good financial condition, and this will be a banner year for them, and we expect a good, big, healthy trade the balance of the year. It will tax our farmers to the utmost to take care of and market their season's crop, and our railroad shops are all busy and working full time getting all their rolling stock in shape to move the crops.

Demand for some lines has been good, but high prices for lumber, &c., have materially curtailed building. Also short crops of last season have had their effect. Collections are improving, and we have a large stock in all lines. Farmers are very prosperous, as a rule, and crops are fine. Building will increase, but the general results of this crop will not be felt until next spring.

Demand compared with other years is below the average, the continued wet weather has affected trade, and there also is a kind of general apathy. Stocks are generally full. Collections above the average, we think. In this vicinity the people in general are prosperous and contented. Cannot get sufficient unskilled labor even at 15 cents an hour. The farmers about here are all rich. Amount of building below the average. We should, with present indications, have a big trade after harvest. Kansas never has been in the shape she is now, and we have been here 32 years.

About an average business, possibly a little less. No corn crop last year hurt our farmers. Prospects are fine. Labor well employed, with a good deal of new building. Collections reasonably fair.

Not much change in demand. Stocks about as usual. Collections are generally fair to good. People generally prospering. This year the wheat crop is small. Generally plenty of work, but not as much as there would have been with a big wheat crop and no hail to kill the corn. Farmers all right financially. Think the fall will give us a fair trade. Kansas is all right. One small crop will not materially affect our prosperity. Much land changing hands, at a much higher price than it could have been bought for 12 to 18 months ago. General condition best it has been since I came here in 1878.

The trade this season has not been good. Our wheat crop was quite a failure. Our fall trade, I think, will be good, as the prospect for corn is very good. Our people are quite prosperous and most of our farmers are well off. There will be some building but not as much as last year.

COLORADO.

Collections are fairly good. Stocks contain only current requirements, with no seeming disposition to buy heavy. Prices are considered abnormally high, which restrains large purchases, feeling that supply sources are manipulated by a coterie that cannot continuously control the situation and some decline is anticipated. Business is about as good as at any period in past three years, no material increase noted. Demand confined to actual requirements of consumer, since money is not on hand in proportion to usual sized purchases. A farmer will buy 200 pounds Barb Wire now, where at a more reasonable figure he would have 500 pounds lying around his place, &c.

Average prosperity of last three years seems undisturbed. Some localities suffered drought, others hailstorms and "washouts," but does not affect general result or conditions. Labor fully employed. Farmers never seem to "have money to burn," they are just as slow in paying one year as another. Building has diminished in above period, owing to "strikes," and when strikes were "off" many investors changed their intentions or decreased the intended investment. With due care or watchfulness conditions will continue good. No menaces appear on the horizon that the average individual can observe. That purchases are limited to actual necessities is a good thing to keep finances healthy.

Business for the first half of 1902 has been good. A larger percentage of the trade has been cash. Mining trade has been much better. My stock is fully up to the average. Collections were good the fore part of the season, but are slow now, owing to the drought and promise of short crops this fall, which is also likely to make trade light with our farmers, but the mining trade is likely to be good. More building than usual. While crops are likely to be short we will have plenty for our own support and some surplus to ship out. Our mining industries promise better than ever before.

NEW MEXICO.

The demand has been better than last year, especially for Carpenters' Tools, as building operations are on the increase. Nails and Builders' Hardware have been moving lively also, but the demand for Cook Stoves has fallen off, although the matrimonial market has been very brisk. We have had our annual drought, but as we depend upon irrigation mostly, it has not done as much harm as otherwise. Stocks are medium; ours never was as full and complete as it is now. Collections are all O.K.

The people seem to be prosperous and in good humor. Labor is at a premium on account of the amount of new railroad building in New Mexico. Our sheep and ranch men having sold their wool at a good price seem to have plenty of money and are buying better grade of goods than usually. Thirty-five dollar Saddles are coming style once more. New buildings are going up all around us, and a new electric company, to get power from our mountain streams. The new railroad, the Santa Fe Central, will soon reach this place. There has been a drop in our western freight rates. All indications point to good business for the balance of the year.

We are enjoying, at the present time, a most excellent business in all lines that we carry. That is, Shelf and Heavy Hardware, Wagon Wood Work, Stoves, Ranges, Iron Pipe and Engineers' and Steam Fitters' Supplies. Our country is looking prosperous at the present time, and the outlook for the trade this fall and winter was never better. We have had a drought which is now broken and we think that the rains have come in time to save all our crops.

I am sorry to report a decided falling off in business in this section of New Mexico, the main cause of it being a strike among the coal miners here, which has lasted over 18 months. The railroad company were compelled to convert several of their coal burning engines into those of oil and use that fuel in place of coal on account of the uncertainty of getting the necessary supply. Stocks are considerably lightened up in consequence of the bad times, and collections are hard. However, we are not at all discouraged, but look for good times this fall, as the labor troubles have been adjusted and there will be an enormous demand for our coal this winter. There is no farming in this country, but a great deal of trading done with the Navajo Indians. Do not look for any building until next year, on account of the past dull times. I am happy to say that my own business has kept up wonderfully good, but then I handle so many lines that I am bound to be kept going. We are sadly in need of rain and if we don't get some soon it will mean awful hard times for the Indians and Mexicans.

INDIAN TERRITORY.

There is a greater demand than in previous years on everything but Builders' Hardware. A bumper corn and cotton crop makes the demand. Inaction by Congress and the Secretary of the Interior in anything pertaining to the Indian Territory is the greatest hindrance to business. Stocks are light at present. No collections as yet, but outlook good. People are prosperous. All who wish work find no trouble in getting employment. Merchants carried most of the farmers over from 1901 for a portion of their indebtedness, but from the outlook they will pay that up, together with debts contracted this year, and have money left. This will be governed to a great extent by the price of corn and cotton. Not much building going on in this locality at present. Most of the towns are new and in advance of the country.

The bulk of our trade is in Implements and kindred lines, although we carry Hardware. The people have bought only what they had to have, consequently our trade was considerably below the average. The cause of the falling off in business was the almost complete failure of the corn crop last year. Collections were, of course, very bad. We have a good wheat and oat crop harvested and partly threshed out, and so far the corn crop is favorable and with another rain will be good. Therefore, considering the condition of things in the Territory, we are fairly prosperous. Collections are coming in now. What we want here is the allotment of the Cherokee lands and then there will be more settled conditions and an influx of people from the States. No one here holds a perfect title to a town lot, and the farms are held by *occupation* of the individual citizens; no titles.

Trade has been light as compared with former years, unsettled state of the Territory, no titles to land, being unallotted, and whites here only by sufferance are hindrances, and failure of crops last year affects sales. Collections are only fair. The usual stocks are on hand. The oats crop splendid, corn two-thirds of a crop, hay crop excellent, cotton acreage doubled and prospects splendid. We expect on the whole a better trade than last year.

Trade is good, the demand being large for builders' material. Implement trade is poor on account of last year's drought and crop failure. Building is due to opening of Comanche reservation and new people locating. Stocks are larger than heretofore. Collections are slow so far. Crops and prospects are fair for fall trade. Farmers are poor on account of last year's drought, but prospect fair for this year. There are some new building enterprises in progress.

OKLAHOMA TERRITORY.

The demand for goods has been small compared with other years, influenced by light crop last year. The main hindrance to a large volume of trade is the building of competing railroads in this section, which has planted towns every 5 or 6 miles, thus greatly affecting our trade. Stocks are usually light. Collections reported as bad; cannot say as to that, however, as we sell for cash. Have had an ideal season for corn and broom corn. We will have the best yield for years. With this the condition of the farmers will continue to improve, as they are giving increased attention to stock raising, which is to their advantage.

We have the finest prospects for trade we have ever had. We have the best crops of all kinds that this country has ever known. Full crops of cotton, corn, wheat, oats, kaffir corn and millet. I have been here since the country first opened in 1889. Indications for trade never were better. Our fruit crop is grand, including apples, peaches, plums, apricots, pears and berries of all kinds. This is the place for investment for canning factories. Our fruit of all kinds equals that of California, and tons of it go to waste every year. Stocks of Hardware are light; not yet stocked up for fall trade, but beginning now to buy. Collections are fine.

As we opened our store at this point December 14 last, we cannot compare former years with this, but we understand general trade in this section has been a little timid owing to corn failure in 1901. The greatest hindrance to good trade is the excess of towns and the working of the territory by catalogue houses. The sizes of stocks, we judge, are normal. Collections are just beginning, and are exceedingly good so far. Farmers are generally in good condition. The demand for labor is very light. The wheat crop just harvested about 25 to 30 per cent. short of last year. Oats and other grains show heavy yield. Corn crop promises to be a "bumper;" conditions almost perfect.

During the past six months trade has been lighter than previously. Demand for Builders' Hardware has been good. We attribute smaller volume of business to shortage of corn crop in this section last year. Stocks are large, with collections fair. Indications are that the volume of business will be fair for next six months. Wheat crop here about half; corn and oats good. This country is entirely agricultural in character.

The demand is rather less than last year, but it is a good average. We will have a short wheat crop. Collections are good. Prospects are excellent for a big corn and cotton crop.

Demand has been greater than previously, but scarcity of foodstuffs and high prices have affected business adversely. Stocks are heavy and collections good. People are in good shape financially. Demand for labor is great. Many gins are being built and a few oil mills. Corn in this locality is good. Wheat and oats have been threshed and yield above average. Best cotton prospects country has ever had. Railroad now building into Greer County is stimulating trade. In fact, Greer County is in excellent condition.

The demand is greater than before, although farmers did not raise good crops last year. Stocks are good. Collections fair. Cotton is backward, but nothing injuring it. All labor is employed. This being a new country, buildings are going up everywhere. We have had fine rains here this year. Good corn crop. Oat crop good. Very small acreage of wheat here last year. The demand for Hardware, and Implements is increasing. We have good stocks.

Trade has been good during the first half of 1902. This country is not a year old yet and cannot expect much from the farmers this year. The stocks are about what they have always carried here. The people are pretty well to do. Labor is pretty well employed. A good deal of building is going on.

NORTHWESTERN STATES.

Reports from this group of States show that in nearly all sections business for the first six months of the present year has at least equaled, if not exceeded, the large trade done during the same period of 1901. *Farmers and the people generally are very prosperous, labor being fully employed, and in some sections at high wages. A large amount of building is in progress, and there has been a decided enhancement in the value of farm lands in several of the States. The outlook for the closing months of the year is reported to be decidedly promising.*

IOWA.

The first half of 1902 was away beyond all expectations: in fact, 1901 was a banner year, but this year, so far, is on top. The demand is more particularly for Farmers' Tools, Hardware, barn building, repairs, Tools and machinery. The farmers in Iowa can sell everything they raise, and at high prices. They are all out of debt and have money to loan. We have not a bill receivable in our accounts from a farmer, and yet every dollar that is charged is as good as gold, in our opinion. This beats any of the past 25 years we have been in trade. City building is light, but mechanics and helpers are in demand at good wages. Everything comes easy and the retailers are all working on a cash business basis. Everything now depends on the harvesting of crops. Rain and wind has interfered and at present it looks bad for corn, oats and hay, our staple crops, as well as for potatoes. If the rains continue it will make a sorry situation. It is reported potatoes are rotting and oats are in the same condition, while corn has been blown down and broken by the winds. If the weather comes dry and warm matters will improve and we will have enough and plenty. Our chief reliance is on corn, oats and hay.

Our demand has not been up to 1901, caused by excessive rainfall. We consider stocks lighter than formerly, on account of high price of goods. The general feeling seems to incline toward reaction in the near future. The indications point to fair fall business. The condition of our farmers is nearly always good. Labor is hard to get. Building is good, considering high price of lumber. We have had very heavy rains: hay has never been better; oats good, but hard to harvest, and corn is about three weeks behind.

Our trade was very good until June, when we fell behind somewhat, owing to the very wet season. Stocks are very well kept up. Collections a little slower than 90 days ago. People in our section are generally prosperous. July is some better than June, but we are still having too much rain, and farmers are somewhat discouraged. Crops are looking very good for the amount of rain we have had, so that unless something unforeseen happens we will have as good trade the last half of the year as the first. Laborers are well employed and farmers are doing well.

Trade first half of 1902 was equal to last year, June being an exception; too much rain. It has rained almost daily for six weeks, after a drought of nine months. The crop indica-

tions are good, except bottom lands along rivers, which are overflowed with water and thousands of acres of corn, wheat, oats, rye, potatoes, &c., are ruined which a week ago promised a great yield. There is not much building here this year; materials are too high. Labor is well employed and people are prosperous in this community.

Business for the first half of 1902 has been good; better than last season. High prices for farm produce have made good trade. Collections are good and farmers pay mostly cash for what they buy. Prosperity never was better; every man, woman and child that can and wants to work can get employment. Farmers are in good condition. Most of them in this section are out of debt and have a small bank account. Many are buying lands in South Dakota, Kansas and Minnesota.

General trade has not been as good as last year. Stock on hand is heavy as compared with other years. Collections only fair. Continued rains have been a hindrance to trade. Fall business should be good if crops can be gathered that are made. The general prosperity of the people is good. Labor is well employed and farmers seem to be well fixed.

MINNESOTA.

A steady, good active business has marked the first half of the year. The rapid advance in value of farming lands last year has continued, caused by the influx of immigrants from the older States, who come with means and disposition to improve their purchases. Increased values of lumber and building material generally, higher cost of wages and living, have had quite an appreciable effect on postponing improvements that were contemplated; nevertheless, there is a good deal of building is progress, both in city and country. Stocks of merchandise are full, but collections are hardly up to the standard of last year.

Except for an ever existing possibility of injury to crops by unfavorable weather, the outlook for a good fall business is excellent; though there certainly is a feeling among the people that many of the staples which are controlled are held at too high a level, and must eventually come down. The huge profits of the consolidations, as shown by their published statements, however satisfactory they may be to Wall street, are by no means pleasing to the people who consume their product at an increased cost.

Business for the first six months of the present year has far exceeded any for the last ten years. The farmers of this part of the country are financially better off than they have been for some time, and the crop prospects are, and have been, excellent. They have been buying a great many goods, and doing a good deal of improving that has been long deferred. The Paint business has been exceptionally good. Stocks, I think, are in pretty good shape generally. Collections are very fair for the season.

I am looking for a continued good trade until the end of the season, and unless something unforeseen occurs we will enjoy the best holiday trade we have ever seen.

Demand for Builders' Hardware exceeds anything ever witnessed in our experience of 25 years. The special influence on trade is the ease with which money can be obtained. While prices seem to be high building operations seem to go on without stop or hindrance. Stocks are, we believe, unusually large; collections are fairly good.

People seem to be prosperous; labor is all employed at good wages. Farmers in this locality are doing but little in the way of building. They have not the means and are not borrowing to keep up their end of what is termed prosperity. Building operations in this city are at high water mark. The things that the laborer has to buy are correspondingly high with his wages, leaving net earnings small for reverses sure to come.

We have only words of praise for 1902. It has been one of the best, if not the very best year since we began business. The extremely high prices that have been paid for farm produce have given the farmer money to spend and his purchases are more liberal than usual. We have not experienced very much difficulty in getting goods promptly and this community is free from all labor troubles that have practically stopped building operations in the large cities. We are carrying an unusually heavy stock for this time of the year.

The indications for business for the remainder of the year are excellent. This community will harvest a bumper crop and the indications are that prices on farm produce will be above the average. The only difficulty is going to be to get help. Farmers are paying $2 and $2.25 per day and many of them cannot get men at that price. We expect that it will be an easy matter to make collections this fall because the farmers are all going to have money, and lots of it.

A large demand for goods is due to the general prosperity and the influx of people to this State and to the Northwest in general. Stocks are medium and collections are good. Labor is so well employed that it is very hard to get competent help.

Demand is slightly less than was expected owing to too light crops caused by too little rainfall. Stocks are medium, but collections are good. There is a heavy local demand for day labor caused by new construction and betterments of railroads. Scarcely any building is being done, as lumber and labor are too high. Farmers are exceedingly prosperous. They have made a great deal of money on stock, but economized on their expenditures to make up for the additional money they would have made had not the period of dryness existed. Rains and hailstorms have caused some losses, but if conditions are normal from now on we look for a very fine trade the remainder of the year. Our town has 8000 inhabitants, and the banks carry over $1,500,000 in deposits, so there is plenty of money here.

Our trade has been very good because farmers are getting good prices for all their products, especially for dairy products and hogs. Another reason for increased trade is the advance of farm land and coming in of new settlers with money. Stocks are about normal and we do not consider it safe to carry more goods than we need for immediate business. Collections are good. The prospects are that business will continue good for remainder of year, as we are just ready to harvest a good crop and all our laboring men and trades people are fully employed at wages from 15 to 25 per cent. higher than usual. This being altogether a farming community we are not affected by any sudden changes. In my judgment the greatest danger at present lies in the fact that most industries are overcapitalized, and when the present big demand for goods subsides they will not be able to earn fixed charges.

Demand for Nails and Builders' Hardware has been good, but not much greater than usual. Sales of Barb Wire have been light, but sales on Woven Wire have been extraordinarily large. Collections have been good, as live pork, which is quite a crop with us, is very high. Crop prospects are very good at present, and times in general are what we call "good times." Prospects, as noted above, would indicate a good business for the fall. Labor is scarce and high, and farmers are financially much better off than ordinarily. Our trade has been very satisfactory and considerably larger than any preceding year in our business.

NEBRASKA.

Business conditions in Nebraska for the first half of 1902 have been peculiar. Owing to failure of the corn crop in 1901 farmers have not been buying except necessities. Hence that class of trade has been cut down. More substantial buildings have been erected throughout the State during this year than has been known in the same length of time in the history of Nebraska. Stocks carried are light, the general opinion being that prices will not go higher, and may drop. Collections good, every man, woman and child seemingly sharing in the general prosperity. The prospects and indications for future business were never so good. Crops, wheat, corn, oats, potatoes, and, in fact, everything that grows, will be immense. Labor is scarce, wages highest ever known. Farmers and merchants in good financial condition. The building fever is well started, and will continue. Capital is being invested, and new enterprises will be launched.

One of the most important features of the business conditions now prevailing is the absence of speculation throughout the West. All investments are on a sound business basis, and the enthusiasm over present and future conditions is not causing reckless and unreasoning expenditures.

Business for the first six months of this year has been satisfactory, and the demand for goods about the same, taking weather condition in consideration. We have had a wet season so far which interfered somewhat with the demand of Builders' Hardware. Stocks are as heavy as ever, if not more so. On account of the high prices of farmers' products collections from them have been good, and no doubt business will be good for the balance of the year. We find that railroad employees are not as well satisfied, all claim that wages are quite low, and in general not satisfactory, but there seems to be plenty of work. There is not as much building in our section of the country as other years.

We think if prices would remain where they are and not fluctuate so much (in other words, if we hadn't so many trusts) it would be much better for business.

There has been an increase in trade over same months of 1891 of 50 per cent. Good prices are obtained for farm products, including cattle and horses. Stocks, as a rule, are well kept up, but no surpluses. Collections are very good. With crops now harvested and conditions of those still growing, barring early frost, last half this and first half of next year must be good. All people are prosperous. The demand for farm labor is greater than the supply. Financial condition of farmers in this section was never better. Building is going on very satisfactorily.

The past year was our banner year. The six months of the present year will not come up to the period of last year. We believe that the catalogue houses are receiving a larger share of the business right along, which cuts quite a figure in the trade. If outside catalogue buying is not large it is at least keeping up its pace. One reason for less business here is that an extra amount of building was done in city last year, and not near as much this year. Building in the farming community is going right along. Stocks are being well kept up. Collections are fairly good. The farmers are the most prosperous people at present, and they are our dependence here. High prices for all grain and produce of the farm increase the bank deposits of the farmer. On top of all a big crop of corn seems sure. Small grain not as good in low lands. Building prospects fair.

NORTH DAKOTA.

Trade has been good in this part of the State. We have had a large immigration of people who have money to invest, and land has been in good demand, and large quantities have been bought by those who will settle on it and make homes. Merchants are well supplied with goods. Collections are good for this season of the year, but our farmers' trade has to be carried to a large extent till after threshing, which is not done till September or October. The prospect for fall trade is good, but, of course, depends on the harvest. The earlier wheat is practically sure of making a fair yield. The late wheat and flax are suffering from dry weather, which, if it continues, will cut down the yield and curtail fall trade and interfere with collections. All kinds of help are scarce, and labor is fully employed, and fears are entertained that harvest hands will be very scarce and high. Farmers are in improved condition, as they are going into stock and are doing a large amount of building. The principal feature of our part of the State is the decided advance in farm lands, which has been from 50 to 100 per cent. in the last year, and the large amount which has changed hands, and a large part has been bought by farmers. Present indications point to a large immigration of practical farmers from Iowa and Wisconsin by another spring.

SOUTH DAKOTA.

Demand has been exceptionally good in nearly all lines. Trade fully double that of one year ago. Have been bothered a good deal in getting goods promptly, particularly from factories. This is true in many lines. This section of the country is in a fairly prosperous condition, attributed to the good crops of last year, the high price of live stock, of which there is a good deal, and also to the great increase in value of farm lands, &c. We are well stocked with about everything, and already have our orders in for all fall goods, to be shipped in ample season. Collections have been good. Our greatest trouble is ignorant competition—those willing to sell at cost in order to make a sale.

The present indications are unusually good. Only about ten days until harvest, which promises to be a bountiful one, corn excepted, which is very late and has been kept back by cool weather. Farmers, as a rule, are fairly prosperous; many are independent and have retired from the farm and have fine homes in town. Nearly every farmer is dependent on the uncertainties of the "hired man" to help care for the crops. Help promises to be scarce and unreliable.

Along the line of hindrances to our trade there is one thing I would like to hit hard, and that is the seeming utter indifference to our wants by so many from whom we buy, particularly the factories. A prompt answer to an order is so exceptional as to be noticeable. Many times we have sent in a rush order for goods, often by telegram, and after waiting several days have been obliged to write for information as to whether they could ship, and if so when; sometimes we get an answer, and as often not.

The demand during the first half of 1902 has been excellent. Best business in years. People generally were never in better condition. Outlook fine.

MONTANA.

Demand is not so good as during 1901. Less work done in logging camps during past winter. Stocks are about an average; fairly good collections. People are prosperous. Labor is generally employed at good wages. Farmers are well to do, having sold their produce at high prices. Residence building average, very few new business enterprises being started.

This year's business is good; better than last year, on account of better prices for stock, wool and farm products. Stocks are moderately heavy. Collections are very good. The people are prosperous and feeling fine. There is plenty of work for good men. Farmers were never in a better condition than they are now. There is a lot of building in this section of the country. I never saw the country in a better condition or more prosperous.

PACIFIC STATES.

The Pacific States generally report a flourishing condition of things. Business has been as good or materially better than during the first six months of last year. Some reference is made to the difficulty which has been experienced in obtaining goods from manufacturers. Farmers are fairly prosperous, and the development of certain sections of Pacific territory is going on rapidly. The outlook for an equally satisfactory condition of business during the remainder of the year is excellent.

CALIFORNIA.

Business for the first half of 1902 was better than during the past few years. The demand has been fair in all lines of Hardware, making the total larger than in previous years. At present stocks are in fair condition; merchants have been anticipating their wants and ordering accordingly. Collections are good. Crops of all kinds are good, prices fair, and we do not see why the last half of the year should not be better than the first. The above conditions put the farmers in good financial circumstances, which will increase the amount of building, and improvements will be made that otherwise would have been delayed.

The demand is greater than any previous year, owing to abundance of capital, large crops and prosperous mining interests. The only hindrance is delay in obtaining goods from Eastern manufacturers, many of whom are several months behind in filling California orders. Stocks are light in staple goods as a rule, with few exceptions. Collections are usually good. Northern California is prosperous. All persons can obtain work at fair prices. The farmers are generally in good financial condition. The amount of building here exceeds any previous year, both in number and class of structures, and very few mortgages are recorded against new buildings. Some persons think building is being overdone, although at present there are comparatively few vacant houses, either for business or dwellings.

We have found trade thus far to be better than any corresponding period for five years. There seems to be an increasing demand for a better grade of goods, people tiring of the trash with which the market has been flooded. Our stock has been kept up with this in view. Collections are easier than for a long time past. Indications are good for balance of year. Plenty of employment for local labor, wages good, and many projected enterprises warrant us in having rosy hopes.

Trade with us during the first half of the year has been excellent, in fact the best year since 1891. Building Hardware has been in great demand, and if we had more mechanics here business would have been better at the present time. Lathers are so scarce that they are getting $10 per day. Owing to the work of our Hardware Association we are getting better prices on staples than ever before, but prices on Builders' Hardware are cut to pieces, owing to one of the wholesale houses catering for this class of trade. We look to the fall trade to be the greatest our State ever saw. All our people are employed. Wages never have been better. With plenty of building going on we cannot help having a good trade if we can only get goods shipped promptly by manufacturers.

WASHINGTON.

Our business has been 65 per cent. heavier for these six months than corresponding time of 1901. The coming in of so many Eastern people with money has had a great influence. Then our 1901 crop was good, and the high prices of all stock have put farmers in better position to buy, and for cash. Our stock is about an average for this time of the year. Collections have been fair for this time of the year, but our collections do not come in until about October 1. We see no reason why business should not continue good, as our crop prospect is good and the farmers are getting in good shape. There is plenty of work for all working classes now. There is quite a little building going on, and farmers will improve greatly if prices hold up.

Trade for the past six months has been good, about the same as 1901; money easier. Stock is full. Indications for future business are good. Plenty of work to be had. Men are scarce. There is a lack of capital for the development of our resources. The demand for our lumber is beyond the manufacturers' capacity.

Demand is good. General prosperity in this section. Stocks are heavier than during any period in the city's history. Collections are fairly good. People now better off. No scarcity of work for all who wish to work. Building very active.

OREGON.

Our business for the first six months in 1902 was better than ever before. Builders' Hardware trade has been especially good this year and nearly 100 new houses have been erected in our little city of 4500 people. There has also been great activity in the Blue River mining camp, and trade along the mining line has been good, and the logging trade has been even better. We are carrying a little heavier stock at this season of the year than we usually do. Collections are good and we are picking up some old scores on account of better times.

The conditions for business for the remainder of the year were never better. The people are unusually prosperous. Every one who wants work, is busy. The farmers are bothered about getting harvest hands. Crops are only fair this year. Wheat and oats will be about 10 to 15 per cent. short. Hops will be a good crop, and of a good quality, and the growers are expecting an unusually large price. A well cultivated hop yard this year will doubtless net the grower $200 per acre. The financial condition of the farmers is good. Many of them are erecting new houses this year, and pretty generally they have money to pay for what they buy. The lumber business has increased from 40 to 50 per cent. the past year.

Demand about same as 1901. Strikes have had a very bad effect on business of May and June. Stocks are heavy. Collections are good. Prosperity general among all classes. Labor well employed. Condition of the farmer better than ever before. More buildings are under erection and contemplated than ever before.

The demand has been much greater this year than any year previous. Our stock is somewhat run down, owing to the delay in shipping goods when ordered. Collections have been above the average. The future prospects in this locality are very bright from the fact that our mining and lumbering interests are growing better all the while. There are a great many men employed here. The financial condition of the farmers is not first-class. There is quite a stir in the line of new building here. The conditions of this State in general appear to be above that of former years, and especially in the localities where there are mining and lumbering interests near them. The farming class of this section are not so prosperous as of former years.

Trade has been as good or better than any previous year. Trade was rather slow in opening up the first three months of the year, but when it did open up was exceedingly good. The sheep market was (that is mutton sheep) hardly up to the prices of last year, but the wool market was much better. Our town markets about 3,000,000 pounds of wool every year, and ships out about 50,000 or 60,000 mutton sheep a year. The wheat crop is a little better than the average crop, harvesting is just commencing. Quality is good and prospect for a fair market is good; most of the farmers are getting in a better condition, financially, right along. Labor is in good demand and hard to get. Harvest hands are scarce. All kinds of business have a healthy appearance. The country is prosperous, the people have faith in the national administration, and the prospect for the immediate future for Eastern Oregon could not be better.

ARIZONA.

On the whole the trade for the first six months of 1902 has been very good, especially considering the shortage of water for irrigation. Collections are very good, but stocks are rather light. Indications for the balance of the year are not very flattering. While labor is all pretty well employed in this place, yet people are buying only what they must have, for we did not get much over half a crop of anything. On the neighboring cattle ranges the drouth is so severe that cattle are dying by the dozens for lack of feed and water, and the cattlemen are very much discouraged. All this tends to make business dull and until we get good rains it will remain so.

In the mining districts business has been active and quite satisfactory. In the agricultural and irrigated part of the country it has been very dry and farmers and cattlemen have not had as good a season as usual, but in general business has been very good and collections satisfactory. Stocks are about normal. Prospects for the future are very good. With prospects of some railroad building and storage reservoirs for irrigating water and activity in mining development, business ought to be very good.

UTAH.

Demand greater than in 1901, which was a good year, caused principally by railroad building; good demand for our farm and ranch products. Inability to get prompt shipment of our orders has been our greatest hindrance. Business demands the carrying of heavy stocks; however, our stock is not much, if any, greater than same time last year, owing to our inability to get prompt shipments. Collections are about on a par with last year. We cannot say that they keep pace with the increase of trade. However, they are not bad.

Prospects for the last half year are good, owing to the great demand for labor which is caused by so much railroad building. Railroad contractors find it difficult to supply their wants. This activity has caused a good local demand for farm and ranch products, and prices for the last year have been ruling high. The beet sugar and tomato canning industries have also been a great factor in making the farmer prosperous, and we don't know of a time when he was better off than he is to-day. About 500 dwellings have been erected here during the past 12 months. No vacant stores or dwellings in the town at the present time. Building of business houses is active and property is increasing in value. Prospects for the next few years in the inter-mountain country we consider bright.

GIVING JOBBERS' PRICES TO DEPARTMENT STORES.

A CORRESPONDENT directs attention to the injustice and disadvantage of manufacturers giving jobbers' prices to department stores who are only retailers:

To the Editor: A subject that will bear attention from the Hardware Dealers' Association is the matter of manufacturers selling direct to department stores, and in many cases giving these retail houses closer prices than are quoted to the small jobber. To be sure, these large retailers will often take quantities of goods in a specified time that no small jobber would undertake to handle, and have unquestionably a greater outlet than has any ordinary retail Hardware store.

The manufacturer who sells regular trade-marked goods to the department stores, at prices lower than the retail Hardwareman could buy same goods from a jobber, will find in time that his only customers will be the department stores and his entire trade on a very cheap class of goods.

It is useless to say, however, that the department store which has opened a Hardware department shall not be recognized, or that the jobber or manufacturer shall not furnish these stores with goods. They will procure goods for which there is a demand, and having such selling capacities they are factors in the trade and must be recognized as such. But the manufacturer should not sell these retailers at lower prices than he quotes other retail houses, and if his policy has been to sell only the jobbing trade that policy should not be broken in the case of the department stores.

Much injury has been done all branches of the Hardware business by manufacturers who have been willing to take business from these department stores at lower prices than the same goods are being sold other retailers. In all our larger city dailies advertisements can be often seen of the department stores offering Lawn Mowers, Hammers, Oil Stoves, Carpenters' Tools, Garden Tools and perhaps mechanics' fine Tools of well-known trade-mark and brand at extremely low prices, and lower than any retail Hardware merchant can afford to sell them; and in some cases perhaps at lower prices than he is buying. The large circulation of the daily newspaper throughout the country and even rural districts, giving great publicity to these advertisements, has the tendency, therefore, of breaking the price on such goods, not only in the immediate city trade, but through the country round about generally.

It is almost impossible for the Hardware merchant to successfully meet these prices. In some cases he endeavors to do so, but in any case he is placed between the dunes and the deep sea. If he fails to meet the price his trade is gone, and if he endeavors to sell at the same price his profits are gone.

The Hardware merchant will naturally stop selling brands of goods on which he sees no profit, and thus the demands through the regular channels will be cut off and the manufacturer will have only the department store trade. Finally these stores, too, will drop his goods when they find other brands being pushed and advertised by the Hardwaremen. Thus it is clearly for the manufacturer's own interests to protect his trade-

marks and to sell department stores, if he is determined to have this trade, at such figures that they will be obliged to maintain fair retail prices on his goods.

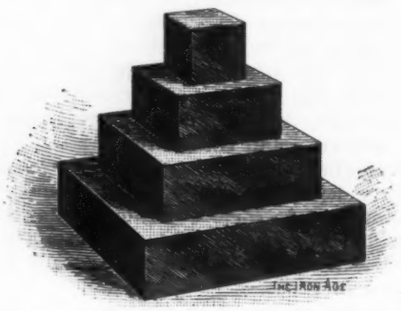
I.

AN ATTRACTIVE TOOL DISPLAY.

BY S. M. ROBINSON.

IT pays once or twice a year to make a very elaborate display of Tools, showing nearly every kind in the store. Usually two days are required to prepare the exhibit so that it will present a creditable appearance and attract attention. Almost anybody can throw a lot of tools in the bottom of a window, but in the successful display they must be so arranged as to compel comment and cause the people to stop and examine them.

For this Tool display we have made four boxes, each 1 foot high, one being 4 feet square, one 3 feet square, one 2 feet square and one 1 foot square. The boxes are all covered with black cloth. After piling them in pyramid shape, as shown in the accompanying illustration, we select some good showy Tools to fasten to the sides of the boxes with small wire brads. These Tools are not fastened merely to the sides of the boxes, but are placed on them in an artistic manner. For instance, we take one side of a box and arrange Bits fan



Pyramid of Boxes for Tool Display.

shape in the center, while on the corners we put a quarter circle of smaller sizes, filling in the vacant spaces with Countersinks, Nail Sets, &c. Another side is covered with Screw Drivers, another with Shears and Scissors. All of our fine Machinists' Tools, like Dividers, Calipers and Rules, are arranged in like manner. The background of black makes the nickel and steel show up to good advantage. We do not confine ourselves entirely to Carpenters' and Machinists' Tools, but make a show of Shoemakers' Kits, Blacksmiths' and Masons' Tools. The shelves of the pyramid are covered with small Tools, such as could not easily be fastened on the sides, and on the top we set a sample of our Oil Drippers, which makes a good top finish.

After the pyramid is completed we cover the back of the window, which is about 8 feet square, with black cloth and proceed to arrange on it Carpenters' Saws in a complete circle in the center; the corners are put in with quarter circles of Chisels, Wrenches, Hammers and Hatchets of all sizes. The little vacant spaces are then filled with smaller Tools. This done, we have ended the hardest work of our Tool display, and all that remains is to fill in the floor space with Planes, Levels, Squares, Mallets and the one hundred and one things which can easily be selected from stock.

EDWARD H. KINNEY, who for about 20 years had been identified with the Iron Clad Mfg. Company, New York, and who for a brief period has been secretary of the Rochester Lamp Company, New York, has been chosen treasurer of the George H. Tay Company, San Francisco, Cal., and left for the Pacific Coast July 29, to assume the duties of his new office, which will be in the way of joint management of the company with Francis J. Baker, secretary. The George H. Tay Company have long been favorably known as wholesale dealers in Plumbers' Supplies, Stoves, Ranges and kindred merchandise.

ROCHESTER LAMP COMPANY.

N. E. TALLMAN, who has been in the service of the Rochester Lamp Company, 38 Park place and 33 Barclay street, New York, for a period of nine years in various capacities, has been made secretary of the company, succeeding Edward H. Kinney, the former secretary, who has resigned to become treasurer of the George H. Tay Company, San Francisco. Mr. Tallman will have direct charge of the details of the business at 38 Park place. It will be recalled that the Rochester Lamp Company, under the entirely new management of the past year or so following the death of Charles S. Upton, its founder and president, until his decease, established a well equipped factory of their own, with modern and improved machinery, at Twenty-fifth street and Tenth avenue, New York, where they are now manufacturing both the Rochester and New Rochester Lamps, of which they are sole owners and patentees in the United States and foreign countries, together with important and well introduced lines of Blue Flame Wickless and Odorless Cook Stoves, Portable Oil Heaters, Gas Chandeliers, Brackets, Portables, Lamp Trimmings and specialties of this character covering a wide range, the product of which is almost as well known abroad as at home. It is the purpose of the interests now in charge of the property to energetically extend and broaden the market for the Rochester line, all the details of which manufacturing and marketing they now control, enabling them to execute promptly orders from both domestic and foreign buyers.

TRADE ITEMS.

THE WADSWORTH-HOWLAND COMPANY, Chicago, who make a specialty of manufacturing Paints for the Hardware trade, have added another distributing point for their goods. The Canada Hardware Company, Montreal, will hereafter carry a full and complete line of their Paints.

WATERBURY BRASS COMPANY, Waterbury, Conn., and 130 Centre street, New York, are getting out an exceptionally complete catalogue relating to the large line of Brass and Copper and related products of which they are manufacturers. It will also contain rules and formulæ and tables and other matter, which will thus be presented in a convenient form for reference. They are now receiving applications from parties who desire to be placed on the mailing list, to whom a copy will be sent as soon as the catalogue is issued.

IN the June issue of the *Granite Monthly* is an illustrated article showing scenes in and about Antrim, N. H., one of the most interesting of which relates to the Goodell Company, located there, manufacturers of Cutlery and Hardware Specialties, including Apple and Vegetable Parers, Bread Crumbers, &c. One view shows a portion of their main plant, while detail views represent some of the many detached shops belonging to the plant. Portraits are given of the Hon. D. H. Goodell, president of the company and former Governor of New Hampshire, his son, R. C. Goodell, vice-president, and their respective residences, as well as much interesting descriptive matter reviewing the history of the company. They also have another plant at Bennington on the Contoocook River.

PRICE-LISTS, CIRCULARS, &c.

BOSTON BELTING COMPANY, Boston and New York: Fire Hose for factory and mill protection. A folder illustrates Cotton Mill Hose, rubber lined; also Linen Hose, unlined, with description and price-list of each.

LALANCE & GROSJEAN MFG. COMPANY, 19 Cliff street, New York: Illustrated catalogue and price-list relating to Galvanized Ware.

THE HOCKADAY HARDWARE COMPANY, Wichita, Kan.: Builders Artistic Hardware. The company issue an illustrated catalogue and price-list containing 175 pages, which is a part of the new 1100-page general catalogue on which they are now working.

THE JOHNSON BROS. HARDWARE COMPANY, Cincinnati, Ohio: Hardware, Cutlery, Tools, Paints, Varnishes, Brushes, Iron, Steel, Saddlery, Tinware, &c. Under date of June 5 the company issue catalogue No. 7, containing 48 pages of illustrations and list prices. A unique feature of the catalogue is the system of prices, all prices printed on white pages being subject to the same discount. The company sell to merchants only and issue these catalagues every two or three months.

THE D. W. BOSLEY COMPANY, Chicago, Ill.: An illustrated catalogue is devoted to Rubber and Felt Weather Strips, Window Cleaners, Floor Scrubbers, &c.

RUSSIA CEMENT COMPANY, Gloucester, Mass.: Le Page's Liquid Glue, Mucilage, Cement and Library Paste. Price-list No. 16 illustrates these goods.

A. B. WARE & Co., Opelika, Ala.: Illustrated catalogue and price-list of Hardware, Crockery, Wooden Ware, &c. The firm issue these catalogues monthly.

STRIEBY & FOOTE COMPANY, Newark, N. J.: Catalogue illustrating Drop Forgings, Motor and Automobile Forgings.

THE AVERY STAMPING COMPANY, Cleveland, Ohio: The company are distributing what they term ping pong blotters, which attractively illustrate the beasts of the wood playing the popular game. For rackets the Never Break Spiders and Griddles are used, the netting being a row of Never Break Kettles and Scotch Bowls. The company are also sending out World Sled Skate and "Foxy" blotters.

SARGENT & Co., New Haven, Conn., and 147-151 Leonard street, New York: Illustrated folder relating to talking points of the Gem Food Chopper.

MORSE CHAIN COMPANY, Trumansburg, N. Y.: Silent Running High Speed Chains for power transmission. A catalogue explains and illustrates the Chains.

THE DIAMOND SAW & STAMPING WORKS, Buffalo, N. Y.: Illustrated pamphlet and price-list of Sterling Hack Saw Blades and Frames, also Kitchen Saws.

BOMMER BROTHERS, Brooklyn, N. Y.: Bommer Spring Hinges. An illustrated pamphlet and price-list shows Hinges in a variety of sizes and styles, for various purposes.

THE EMPIRE FORGE COMPANY, Troy, N. Y.: Portable Forges. The company's catalogue and price-list illustrates the following portable Forges: Empire, Acme, Special Western, Reliable Western, and Universal. A line of Blowers and Tuyere Irons are also shown. The Acme Lever Forge has lately been added to their line.

THE PETERS CARTRIDGE COMPANY, Cincinnati, Ohio, Eastern branch 80 Chambers street, New York: July, 1902, price-list of Metallic Shotgun Ammunition, Primers and Gun Wads.

Holt's Patent Saw Set.

G. L. Holt, Hartford, Conn., is offering the saw set herewith shown. The working lever, which is the lower handle, is placed underneath to eliminate all motion of

Holt's Patent Saw Set.

the tool or hand while setting saws. The pin, which retains the plunger spring, extends into a slot below to prevent the plunger turning out of position, and also permits driving the pin out to change the plunger, if desired, for an extra one having a very fine point for the finest saws, or for dressing up the point of the plunger if damaged by careless use. The knurled head screw which regulates the pitch gauge is provided with a hole for a wire nail for use in tightening anl loosening the screw. The set is designed for setting all saws, including the widest and narrowest, and the quality of the material and the workmanship are especially alluded to by the manufacturer, by whom the set is fully warranted.

Box Steel Rail Mattresses.

Charles H. Hard, 150-154 Ellicott street, Buffalo, N. Y., for whom Hendricks & Class, 150 Nassau street, New York, are sales agents, have recently put on the market a woven wire mattress having some entirely new features, some of which are shown in the accompanying sectional cuts. Fig. 2 represents one corner of the mattress, showing how the woven fabric is

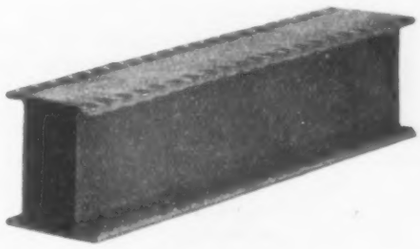


Fig. 1.—New Box Steel Rail.

secured permanently to the substantial hard wood head and foot strips, which run at right angles with the length of the bed. It will be seen that a sheet metal curved strip pinches the wire fabric into grooves in the wood at both top and bottom and is held rigidly by screwing the strips fast. The wood strips rest upon and are supported by a patented box steel rail, Fig. 1, which extends from head to foot of bedstead on each side. This form of rail is alluded to as not only vermin proof, but water tight, while its light weight recommends it as especially adaptable for ship use, in staterooms, berths, &c., at the same time making a better appearance than wood or angle iron and being stiffer than either. The rail is 1½ x 1¾ inches in cross section, a length of which 6 feet long weighs but 5 pounds. These patented mattresses are made in a number of styles, called variously Independence, American, Columbian, Empire, Imperial and Twentieth Century,

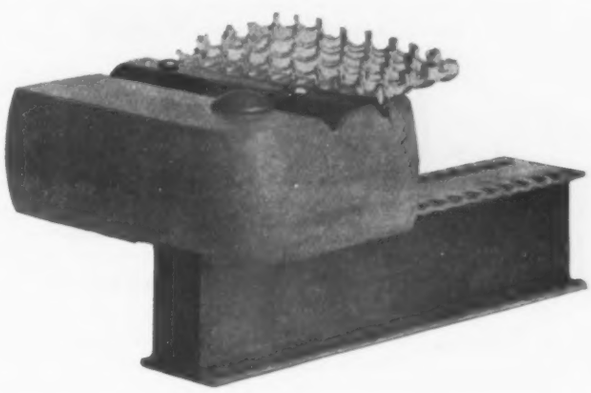


Fig. 2.—Corner of Wire Mattress and Rail.

the differences in price varying with the number of cables, from 8 to 33, and length of wire used in the fabric, from 3829 to 7127 feet. One mattress designed for export is so made that the woven fabric can be easily released and rolled, and as easily assembled, there being two long iron bolts at the foot with which to get the proper tension in stretching the wire, thus greatly reducing the cubic measurement for shipment abroad.

The Taylor Quick Adjusting Self Locking Clamps.

James L. Taylor, 30 Lawrence street, Newark, N. J., is offering the clamps shown herewith. In Fig. 2 a portion of the sliding head is cut away, showing the hardened oil tempered serrated steel gripping blocks, one of which is at the bottom of the bar and the other at the

Fig. 1.—The Taylor Clamp No. 10.

top of the bar in the rear part of the head. In a corresponding position, in the front part of the sliding head, is a V-shaped steel spring. The gripping principle is the same in all the clamps. The steel blocks are file tested and the serrated faces are milled in. The screws are of steel, and the seats on the stationary jaws are finished square and true with the bars, so that the clamps will grip the work true. The malleable portions of the clamps are made of air furnace refined malleable iron. The point is made that as there are no serrations

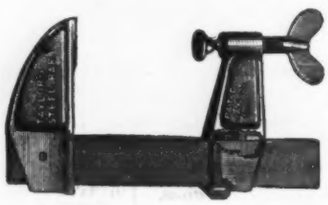


Fig. 2.—The Taylor Steel Bar Screw Clamp No. 20.

on the bars a much finer adjustment is obtained, and that the bars are not weakened. Clamp No. 10 is all of malleable iron, and is made in six sizes, to open from 3 to 12 inches. Clamp No. 20 has a steel bar, and is designed for use by cabinet, carriage, piano and pattern makers; also for furniture makers and repairers, &c. Clamp No. 25 is a steel bar carpenter's clamp, with a stationary head, in which the screw works. It is explained that the siding heads can be instantly opened or closed the full length of the bars and yet are locked for clamping purposes wherever they are left. In operation the sliding head is opened wider than the work to

Fig. 3.—The Taylor Carpenter Clamp No. 25.

be clamped, the clamp is then placed in position; the pressure of one finger slides the head against the work when two or three turns on the thumb screw applies the power. The point is made that owing to the fact that the screws are not used in adjusting a much finer and more powerful thread can be used, and that the clamping action is positive, as the greater the strain the tighter the grip. All clamps are tested to over 1400 pounds clamping strain, it is stated, before leaving the factory.

J. D. Owens, dealer in Hardware, Stoves, Agricultural Implements, &c., Cameron, W. Va., has removed his business to new quarters.

Never-Burn Drip Pan.

The Bronson-Walton Company, Cleveland, Ohio, for whom John H. Graham & Co., 113 Chambers street, New York, are direct representatives, have just supplemented their line of Brown Beauty roasting pans, recently illustrated in these columns, by the addition of the Never-Burn dripping pan, here shown, which has some of the characteristics of the roaster, at much less cost. The Never-Burn pan has coppered steel rods along the bottom surface lengthwise, raising it from the oven floor and leaving an air space, which serves to keep an even heat all around the pan and prevent burning on the bottom. The steel rods also take all the wear and permit the hot pan and its contents to slide easily in and out of the oven regardless of the weight of its contents. This style of pan is made variably of the best quality of sheet metal, as follows: Smooth, from Wood's refined iron; polished, from Wellsville polished steel, and still a third group from heavy tin plate. The handles are so secured to the pan that in lifting they stop in a horizontal position and at right angles with the pan, thus preventing burnt fingers in handling a hot utensil. The

Never-Burn Drip Pan.

pans are all uniformly 2½ inches deep and of the following dimensions: 9 x 14, 10 x 12, 10 x 15, 11 x 16, 12 x 17 and 16 x 17 inches.

The Perfection Fruit Jar Wrench and Perfection Jar Holder.

Drake & Mills, Cleveland, Ohio, are introducing the fruit jar wrench and holder shown herewith. The wrench is stamped from hard steel and is nickeled on copper, which produces a dull white finish. It is absolutely unbreakable, it is stated, and fits all sizes of fruit jar covers. It is built on the lever principle, the fulcrum crowding the arc of a circle against the jar top, which is surrounded by an annular ring, in such a way as to make a positive grip, without injuring the cover. The holder is designed to be used in connection with the wrench in holding the jar while tightening the cover and in carrying the hot jar to prevent being burned, obviating the necessity of wrapping the jar with a wet cloth. There is no danger, it is remarked, in using the holder, as it would be impossible to crush the jar, as

The Perfection Fruit Jar Wrench and Jar Holder.

the band is of light flexible steel and makes a contact about the whole circumference of the jar. The holder is made from pressed steel and will fit any pint, quart or half gallon jar. It may also be used for tightening and removing the Canadian tops. The manufacturers express their willingness to send sample and give full information and prices to the trade.